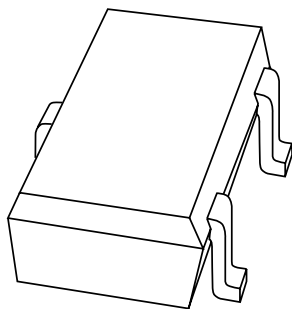


# DATA SHEET



## **PMST2907A** PNP switching transistor

Product specification  
Supersedes data of 1999 Apr 22

2001 Nov 19

PNP switching transistor

PMST2907A

FEATURES

- Low current (max. 600 mA)
- Low voltage (max. 60 V).

APPLICATIONS

- Medium power switching
- General purpose amplification.

DESCRIPTION

PNP switching transistor in an SC-70; SOT323 plastic package. NPN complement: PMST2222A.

MARKING

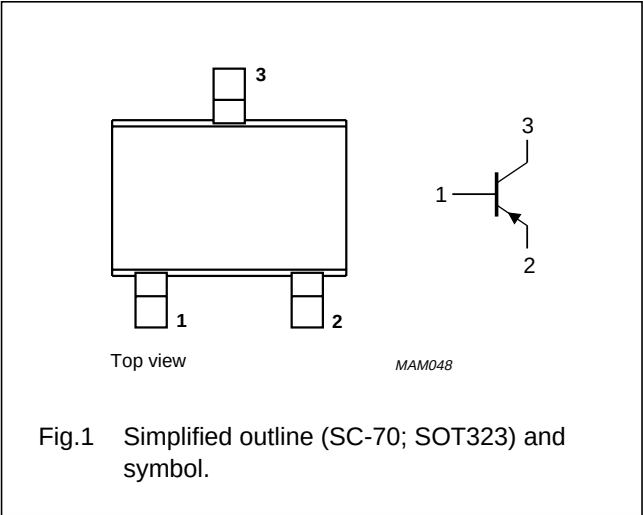
| TYPE NUMBER | MARKING CODE <sup>(1)</sup> |
|-------------|-----------------------------|
| PMST2907A   | *2F                         |

Note

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

PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1   | base        |
| 2   | emitter     |
| 3   | collector   |



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                        | –    | –60  | V    |
| V <sub>EBO</sub> | emitter-base voltage          | open collector                   | –    | –5   | V    |
| I <sub>C</sub>   | collector current (DC)        |                                  | –    | –600 | mA   |
| I <sub>CM</sub>  | peak collector current        |                                  | –    | –800 | mA   |
| I <sub>BM</sub>  | peak base current             |                                  | –    | –200 | mA   |
| P <sub>tot</sub> | total power dissipation       | T <sub>amb</sub> ≤ 25 °C; note 1 | –    | 200  | mW   |
| T <sub>stg</sub> | storage temperature           |                                  | –65  | +150 | °C   |
| T <sub>j</sub>   | junction temperature          |                                  | –    | 150  | °C   |
| T <sub>amb</sub> | operating ambient temperature |                                  | –65  | +150 | °C   |

Note

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

## PNP switching transistor

## PMST2907A

## THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                                   | CONDITIONS | VALUE | UNIT |
|---------------|---------------------------------------------|------------|-------|------|
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | note 1     | 625   | 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            | $I_E = 0; V_{CB} = -50\text{ V}$                                                | –    | –10  | nA            |
|             |                                      | $I_E = 0; V_{CB} = -50\text{ V}; T_J = 150\text{ }^{\circ}\text{C}$             | –    | –10  | $\mu\text{A}$ |
| $I_{EBO}$   | emitter cut-off current              | $I_C = 0; V_{EB} = -3\text{ V}$                                                 | –    | –50  | nA            |
| $h_{FE}$    | DC current gain                      | $V_{CE} = -10\text{ V}$<br>$I_C = -0.1\text{ mA}$                               | 75   | –    |               |
|             |                                      | $I_C = -1\text{ mA}$                                                            | 100  | –    |               |
|             |                                      | $I_C = -10\text{ mA}; \text{note 1}$                                            | 100  | –    |               |
|             |                                      | $I_C = -150\text{ mA}; \text{note 1}$                                           | 100  | 300  |               |
|             |                                      | $I_C = -500\text{ mA}; \text{note 1}$                                           | 50   | –    |               |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = -150\text{ mA}; I_B = -15\text{ mA}; \text{note 1}$                      | –    | –400 | mV            |
|             |                                      | $I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{note 1}$                      | –    | –1.6 | V             |
| $V_{BEsat}$ | base-emitter saturation voltage      | $I_C = -150\text{ mA}; I_B = -15\text{ mA}; \text{note 1}$                      | –    | –1.3 | V             |
|             |                                      | $I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{note 1}$                      | –    | –2.6 | V             |
| $C_c$       | collector capacitance                | $I_E = I_E = 0; V_{CB} = -10\text{ V}; f = 1\text{ MHz}$                        | –    | 8    | pF            |
| $C_e$       | emitter capacitance                  | $I_C = I_C = 0; V_{EB} = -2\text{ V}; f = 1\text{ MHz}$                         | –    | 30   | pF            |
| $f_T$       | transition frequency                 | $I_C = -50\text{ mA}; V_{CE} = -20\text{ V}; f = 100\text{ MHz}; \text{note 1}$ | 200  | –    | MHz           |

## Switching times (between 10% and 90% levels); (see Fig.2)

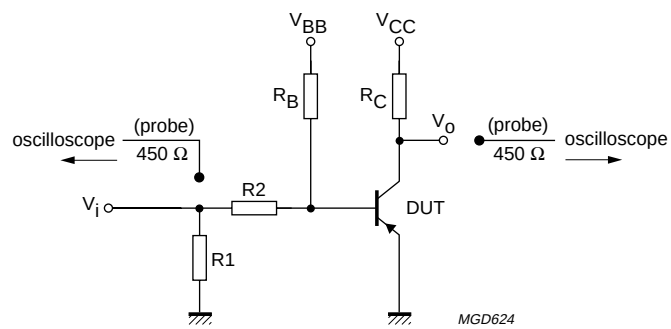
|           |               |                                                                                   |   |     |    |
|-----------|---------------|-----------------------------------------------------------------------------------|---|-----|----|
| $t_{on}$  | turn-on time  | $I_{Con} = -150\text{ mA}; I_{Bon} = -15\text{ mA};$<br>$I_{Boff} = 15\text{ mA}$ | – | 45  | ns |
| $t_d$     | delay time    |                                                                                   | – | 15  | ns |
| $t_r$     | rise time     |                                                                                   | – | 35  | ns |
| $t_{off}$ | turn-off time |                                                                                   | – | 300 | ns |
| $t_s$     | storage time  |                                                                                   | – | 250 | ns |
| $t_f$     | fall time     |                                                                                   | – | 50  | ns |

## Note

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

## PNP switching transistor

## PMST2907A



$V_i = -9.5 \text{ V}$ ;  $T = 500 \text{ } \mu\text{s}$ ;  $t_p = 10 \text{ } \mu\text{s}$ ;  $t_r = t_f \leq 3 \text{ ns}$ .  
 $R_1 = 68 \text{ } \Omega$ ;  $R_2 = 325 \text{ } \Omega$ ;  $R_B = 325 \text{ } \Omega$ ;  $R_C = 160 \text{ } \Omega$ .  
 $V_{BB} = 3.5 \text{ V}$ ;  $V_{CC} = -29.5 \text{ V}$ .  
 Oscilloscope input impedance  $Z_i = 50 \text{ } \Omega$ .

Fig.2 Test circuit for switching times.

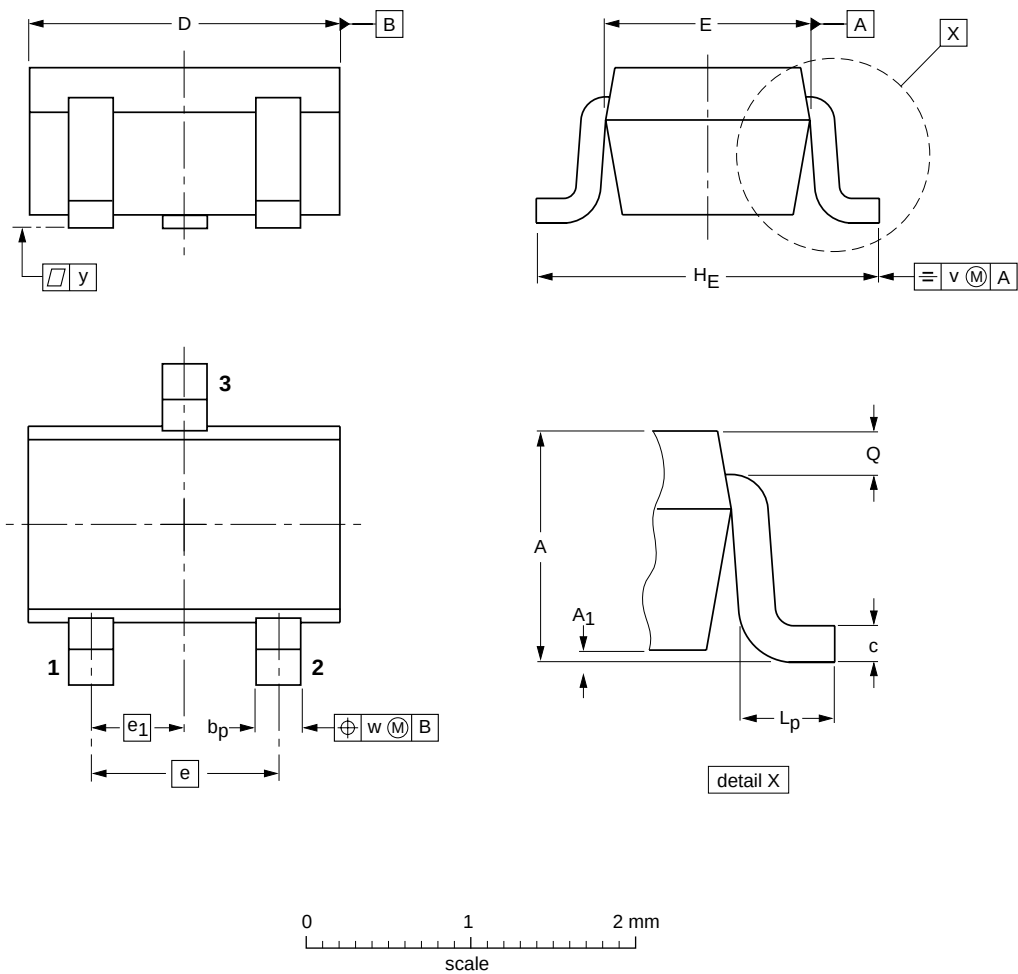
PNP switching transistor

PMST2907A

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT323



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | A <sub>1</sub><br>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<br>0.8 | 0.1                   | 0.4<br>0.3     | 0.25<br>0.10 | 2.2<br>1.8 | 1.35<br>1.15 | 1.3 | 0.65           | 2.2<br>2.0     | 0.45<br>0.15   | 0.23<br>0.13 | 0.2 | 0.2 |

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

## PNP switching transistor

PMST2907A

## DATA SHEET STATUS

| DATA SHEET STATUS <sup>(1)</sup> | PRODUCT STATUS <sup>(2)</sup> | DEFINITIONS                                                                                                                                                                                                                                                                                                            |
|----------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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.                                                                                                                            |
| 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.                                     |
| Product data                     | Production                    | This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Changes will be communicated according to the Customer Product/Process Change Notification (CPCN) procedure SNW-SQ-650A. |

## Notes

1. Please consult the most recently issued data sheet before initiating or completing a design.
2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL <http://www.semiconductors.philips.com>.

## 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.

**Application information** — Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors make no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

## DISCLAIMERS

**Life support applications** — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips Semiconductors customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

**Right to make changes** — Philips Semiconductors reserves the right to make changes, without notice, in the products, including circuits, standard cells, and/or software, described or contained herein in order to improve design and/or performance. Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no licence or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

---

PNP switching transistor

PMST2907A

---

**NOTES**

# ***Philips Semiconductors – a worldwide company***

## **Contact information**

For additional information please visit <http://www.semiconductors.philips.com>. Fax: **+31 40 27 24825**

For sales offices addresses send e-mail to: [sales.addresses@www.semiconductors.philips.com](mailto:sales.addresses@www.semiconductors.philips.com).

© Koninklijke Philips Electronics N.V. 2001

SCA73

All rights are reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner.

The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Printed in The Netherlands

613514/03/pp8

Date of release: 2001 Nov 19

Document order number: 9397 750 09002

*Let's make things better.*

**Philips  
Semiconductors**



**PHILIPS**