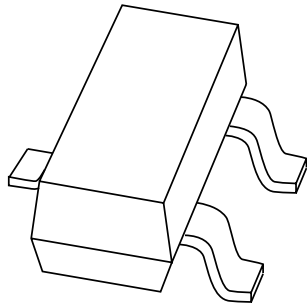


# DATA SHEET



## **PMBT2907; PMBT2907A** PNP switching transistors

Product data sheet  
Supersedes data of 1999 Apr 27

2004 Jan 16

# PNP switching transistors

# PMBT2907; PMBT2907A

### FEATURES

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

### APPLICATIONS

- Switching and linear amplification.

### DESCRIPTION

PNP switching transistor in a SOT23 plastic package.  
NPN complements: PMBT2222 and PMBT2222A.

### MARKING

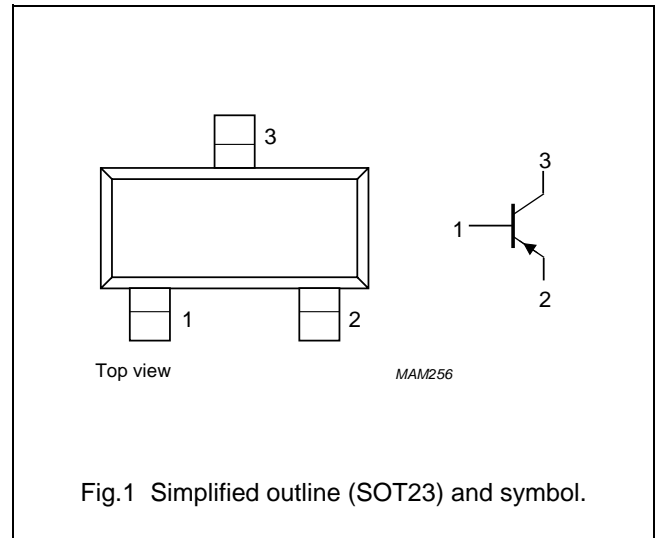
| TYPE NUMBER | MARKING CODE <sup>(1)</sup> |
|-------------|-----------------------------|
| PMBT2907    | *2B                         |
| PMBT2907A   | *2F                         |

### Note

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

### PINNING

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



### ORDERING INFORMATION

| TYPE NUMBER | PACKAGE |  |         |
|-------------|---------|--|---------|
|             | NAME    | DESCRIPTION                              | VERSION |
| PMBT2907    | –       | plastic surface mounted package; 3 leads | SOT23   |
| PMBT2907A   | –       | plastic surface mounted package; 3 leads | SOT23   |

## PNP switching transistors

## PMBT2907; PMBT2907A

**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                | –    | –60  | V    |
| $V_{CEO}$ | collector-emitter voltage<br>PMBT2907<br>PMBT2907A | open base                   | –    | –40  | V    |
|           |  |                             | –    | –60  | V    |
| $V_{EBO}$ | emitter-base voltage                               | open collector              | –    | –5   | V    |
| $I_C$     | collector current (DC)                             |                             | –    | –600 | mA   |
| $I_{CM}$  | peak collector current                             |                             | –    | –800 | mA   |
| $I_{BM}$  | peak base current                                  |                             | –    | –200 | mA   |
| $P_{tot}$ | total power dissipation                            | $T_{amb} \leq 25\text{ °C}$ | –    | 250  | mW   |
| $T_{stg}$ | storage temperature                                |                             | –65  | +150 | °C   |
| $T_j$     | junction temperature                               |                             | –    | 150  | °C   |
| $T_{amb}$ | operating ambient temperature                      |                             | –65  | +150 | °C   |

**THERMAL CHARACTERISTICS**

| SYMBOL        | PARAMETER                                   | CONDITIONS | VALUE | UNIT |
|---------------|---|------------|-------|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | note 1     | 500   | K/W  |

**Note**

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

## PNP switching transistors

## PMBT2907; PMBT2907A

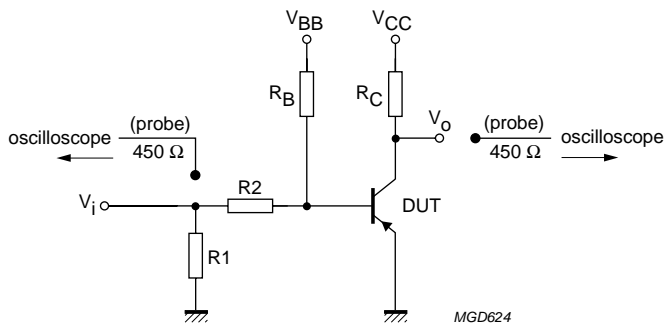
## CHARACTERISTICS

$T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

| SYMBOL   | PARAMETER   | CONDITIONS  | MIN. | MAX. | UNIT          |
|--|---|---|------|------|---------------|
| $I_{CBO}$  | collector-base cut-off current<br>PMBT2907<br>PMBT2907A | $I_E = 0; V_{CB} = -50\text{ V}$  | –    | –20  | nA            |
|  |   |   | –    | –10  | nA            |
|  | collector-base cut-off current<br>PMBT2907<br>PMBT2907A | $I_E = 0; V_{CB} = -50\text{ V}; T_j = 125\text{ }^\circ\text{C}$                 | –    | –20  | $\mu\text{A}$ |
|  |   |   | –    | –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<br>PMBT2907<br>PMBT2907A                | $I_C = -0.1\text{ mA}; V_{CE} = -10\text{ V}$                                     | 35   | –    |               |
|  |   |   | 75   | –    |               |
|  | DC current gain<br>PMBT2907<br>PMBT2907A                | $I_C = -1\text{ mA}; V_{CE} = -10\text{ V}$                                       | 50   | –    |               |
|  |   |   | 100  | –    |               |
|  | DC current gain<br>PMBT2907<br>PMBT2907A                | $I_C = -10\text{ mA}; V_{CE} = -10\text{ V}$                                      | 75   | –    |               |
|  |   |   | 100  | –    |               |
| DC current gain<br>PMBT2907<br>PMBT2907A                         | $I_C = -150\text{ mA}; V_{CE} = -10\text{ V}$           | 100   | 300  |      |               |
| DC current gain<br>PMBT2907<br>PMBT2907A                         | $I_C = -500\text{ mA}; V_{CE} = -10\text{ V}$           | 30  | –    |      |               |
|  |   | 50  | –    |      |               |
| $V_{CEsat}$  | collector-emitter saturation voltage                    | $I_C = -150\text{ mA}; I_B = -15\text{ mA}$                                       | –    | –400 | mV            |
|  |   | $I_C = -500\text{ mA}; I_B = -50\text{ mA}$                                       | –    | –1.6 | V             |
| $V_{BEsat}$  | base-emitter saturation voltage                         | $I_C = -150\text{ mA}; I_B = -15\text{ mA}$                                       | –    | –1.3 | V             |
|  |   | $I_C = -500\text{ mA}; I_B = -50\text{ mA}$                                       | –    | –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                                    | $I_C = -50\text{ mA}; V_{CE} = -20\text{ V}; f = 100\text{ MHz}$                  | 200  | –    | MHz           |
| <b>Switching times (between 10% and 90% levels); (see Fig.2)</b> |   |   |      |      |               |
| $t_{on}$   | turn-on time  | $I_{Con} = -150\text{ mA}; I_{Bon} = -15\text{ mA};$<br>$I_{Boff} = 15\text{ mA}$ | –    | 40   | ns            |
| $t_d$  | delay time  |   | –    | 12   | ns            |
| $t_r$  | rise time   |   | –    | 30   | ns            |
| $t_{off}$  | turn-off time   |   | –    | 365  | ns            |
| $t_s$  | storage time  |   | –    | 300  | ns            |
| $t_f$  | fall time   |   | –    | 65   | ns            |

PNP switching transistors

PMBT2907; PMBT2907A



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

Fig.2 Test circuit for switching times.

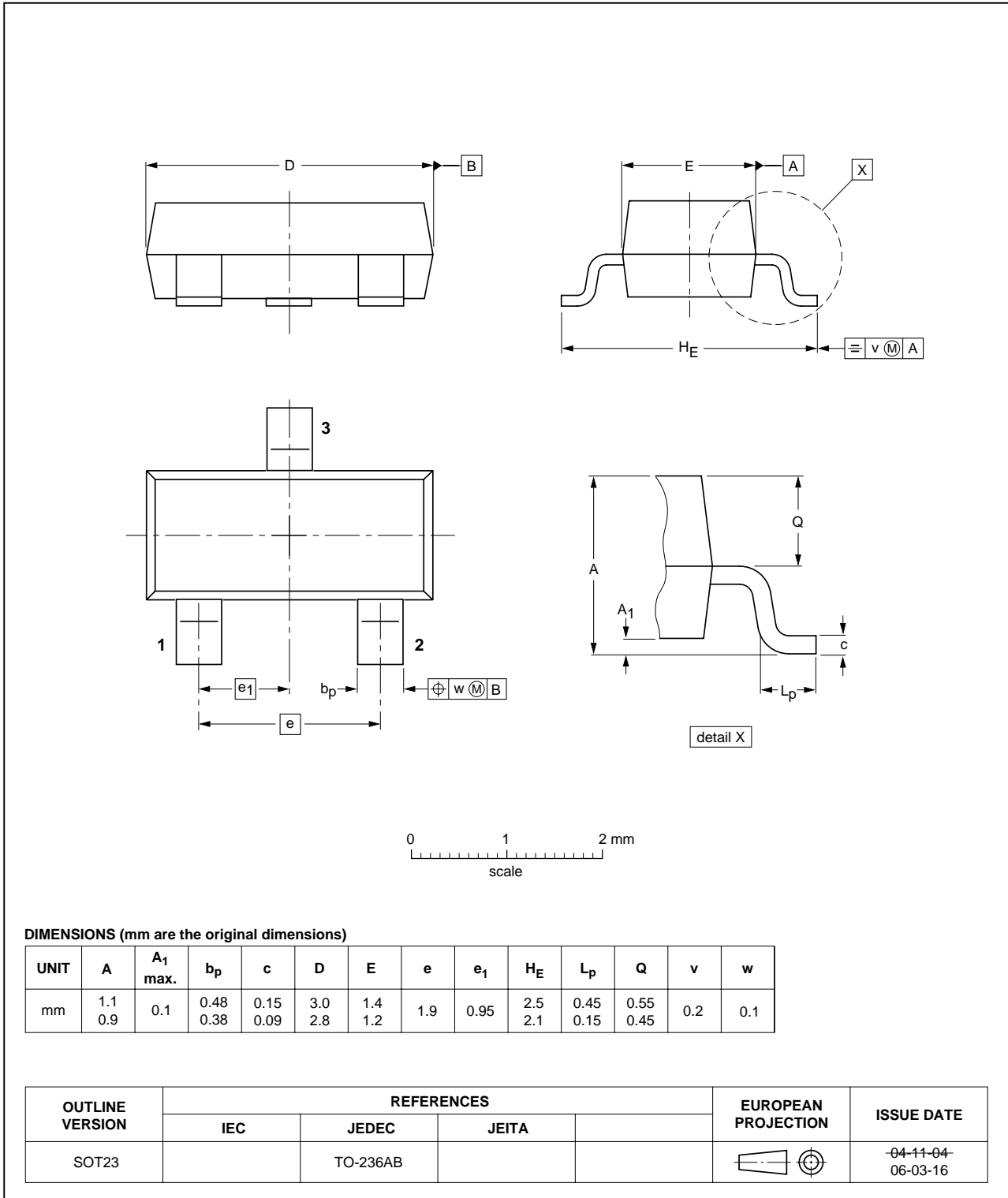
PNP switching transistors

PMBT2907; PMBT2907A

PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



## PNP switching transistors

## PMBT2907; PMBT2907A

## 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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