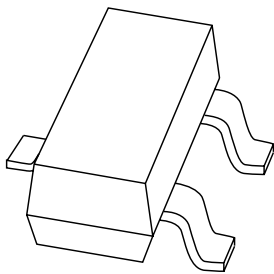


DATA SHEET



PMBS3906

PNP general purpose transistor

Product data sheet
Supersedes data of 1999 Apr 22

2004 Feb 02

PNP general purpose transistor

PMBS3906

FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 40 V).

APPLICATIONS

- General purpose switching and amplification, e.g. telephony and professional communication equipment.

DESCRIPTION

PNP transistor in a SOT23 plastic package.
NPN complement: PMBS3904.

MARKING

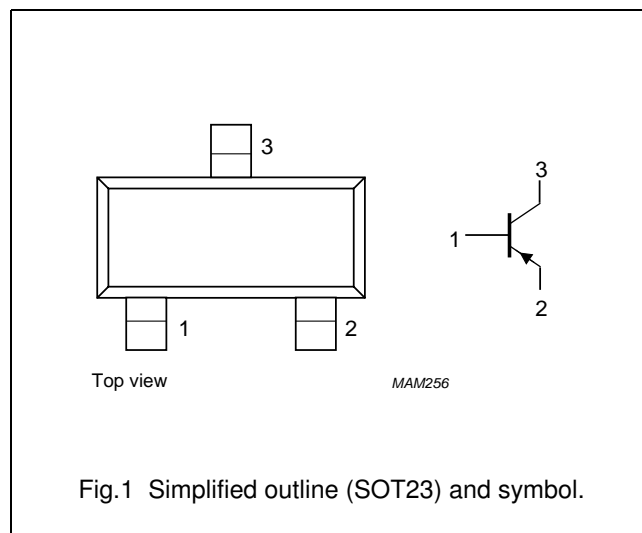
| TYPE NUMBER | MARKING CODE ⁽¹⁾ |
|-------------|-----------------------------|
| PMBS3906 | *O6 |

Note

1. * = 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 |
| PMBS3906 | — | plastic surface mounted package; 3 leads | SOT23 |

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 capability | | — | −100 | mA |
| I_{CM} | peak collector current | | — | −200 | 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 |

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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.

CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-------------|--------------------------------------|--|-----------------------------|-------------------------|----------|
| I_{CBO} | collector cut-off current | $I_E = 0$; $V_{CB} = -30\text{ V}$ | — | —50 | nA |
| I_{EBO} | emitter cut-off current | $I_C = 0$; $V_{EB} = -5\text{ V}$ | — | —50 | nA |
| h_{FE} | DC current gain | $V_{CE} = -1\text{ V}$; (see Fig.2) $I_C = -0.1\text{ mA}$ $I_C = -1\text{ mA}$ $I_C = -10\text{ mA}$ $I_C = -50\text{ mA}$; note 1 $I_C = -100\text{ mA}$; note 1 | 60 80 100 60 30 | — — 300 — — | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = -10\text{ mA}$; $I_B = -1\text{ mA}$ $I_C = -50\text{ mA}$; $I_B = -5\text{ mA}$; note 1 | — — | —250 —400 | mV mV |
| V_{BEsat} | base-emitter saturation voltage | $I_C = -10\text{ mA}$; $I_B = -1\text{ mA}$ $I_C = -50\text{ mA}$; $I_B = -5\text{ mA}$; note 1 | — — | —850 —950 | mV mV |
| C_c | collector capacitance | $I_E = i_e = 0$; $V_{CB} = -5\text{ V}$; $f = 100\text{ MHz}$ | — | 4.5 | pF |
| C_e | emitter capacitance | $I_C = i_c = 0$; $V_{EB} = -0.5\text{ V}$; $f = 100\text{ MHz}$ | — | 12 | pF |
| f_T | transition frequency | $I_C = -10\text{ mA}$; $V_{CE} = -20\text{ V}$; $f = 100\text{ MHz}$ | 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 kHz | — | 4 | dB |

Switching times (between 10% and 90% levels); (see Fig.3)

| | | | | | |
|-----------|---------------|--|---|-----|----|
| 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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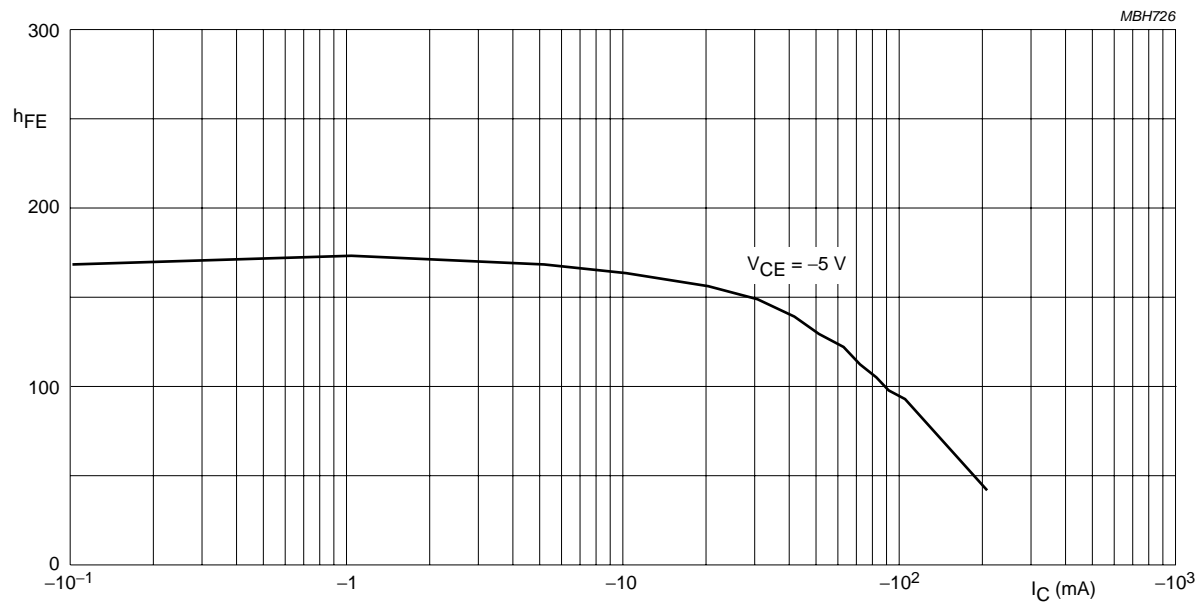
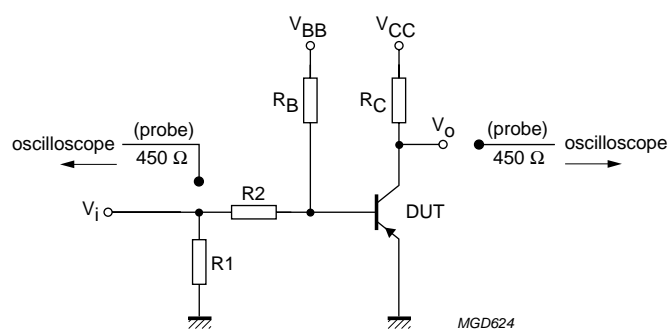


Fig.2 DC current gain; typical values.



$V_i = -5\text{ V}$; $T = 500\text{ }\mu\text{s}$; $t_p = 10\text{ }\mu\text{s}$; $t_r = t_f \leq 3\text{ ns}$.
 $R_1 = 56\text{ }\Omega$; $R_2 = 2.5\text{ k}\Omega$; $R_B = 3.9\text{ k}\Omega$; $R_C = 270\text{ }\Omega$.
 $V_{BB} = 1.9\text{ V}$; $V_{CC} = 3\text{ V}$.
 Oscilloscope input impedance $Z_i = 50\text{ }\Omega$.

Fig.3 Test circuit for switching times.

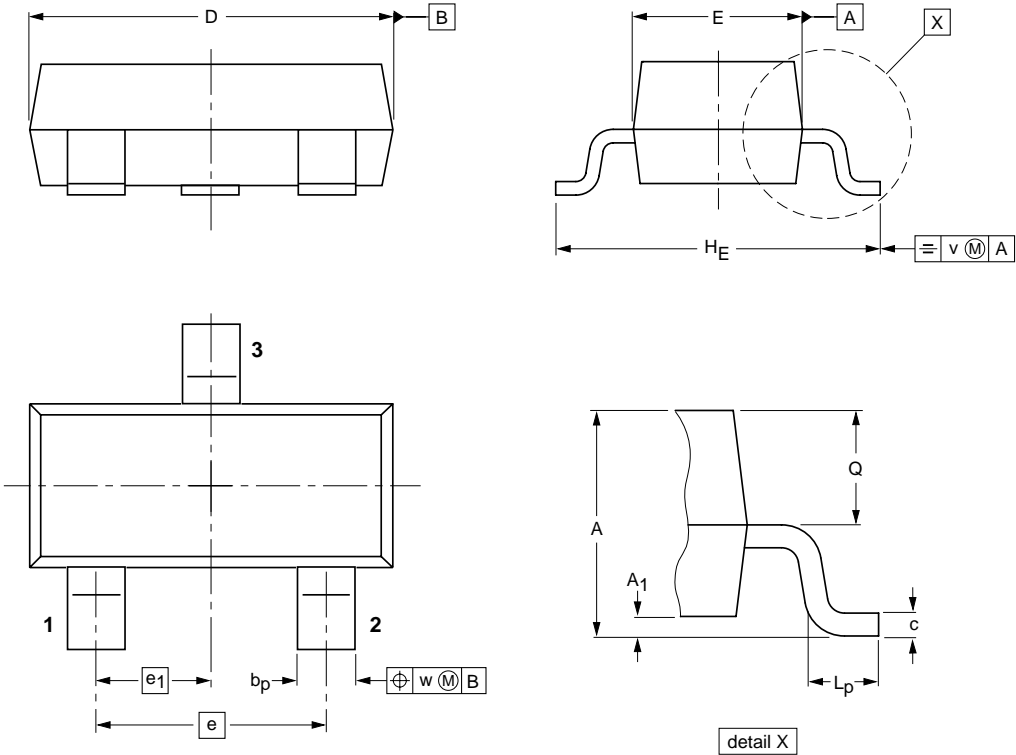
PNP general purpose transistor

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PACKAGE OUTLINE


Plastic surface-mounted package; 3 leads

SOT23



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 0.9 | 0.1 | 0.48 0.38 | 0.15 0.09 | 3.0 2.8 | 1.4 1.2 | 1.9 | 0.95 | 2.5 2.1 | 0.45 0.15 | 0.55 0.45 | 0.2 | 0.1 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|----------|-------|--|---|----------------------|
| | IEC | JEDEC | JEITA | | | |
| SOT23 | | TO-236AB | | |  | 04-11-04 06-03-16 |

PNP general purpose transistor

PMBS3906

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. |

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