

## PNP high-voltage transistor

## PMBT5401

## FEATURES

- Low current (max. 300 mA)
- High voltage (max. 150 V).

## APPLICATIONS

- Switching and amplification in high voltage applications such as telephony.

## DESCRIPTION

PNP high-voltage transistor in a SOT23 plastic package.  
NPN complement: PMBT5550.

## MARKING

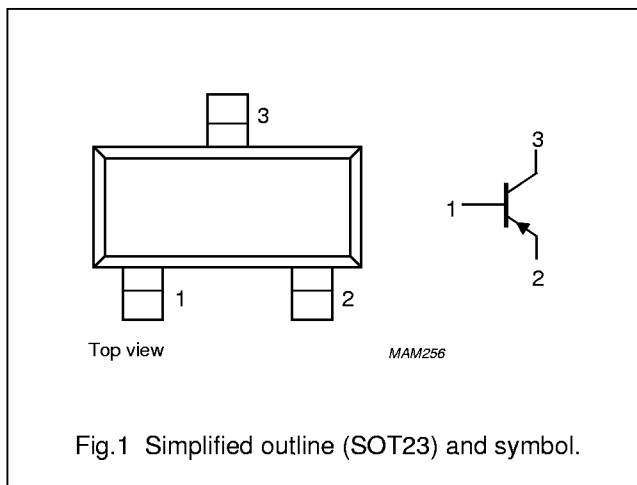
| TYPE NUMBER | MARKING CODE <sup>(1)</sup> |
|-------------|-----------------------------|
| PMBT5401    | *2L                         |

## Note

- \* = p : 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 134).

| SYMBOL    | PARAMETER                     | CONDITIONS                           | MIN. | MAX. | UNIT |
|-----------|-------------------------------|--------------------------------------|------|------|------|
| $V_{CBO}$ | collector-base voltage        | open emitter                         | —    | –160 | V    |
| $V_{CEO}$ | collector-emitter voltage     | open base                            | —    | –150 | V    |
| $V_{EBO}$ | emitter-base voltage          | open collector                       | —    | –5   | V    |
| $I_C$     | collector current (DC)        |                                      | —    | –300 | mA   |
| $I_{CM}$  | peak collector current        |                                      | —    | –600 | mA   |
| $I_{BM}$  | peak base current             |                                      | —    | –100 | mA   |
| $P_{tot}$ | total power dissipation       | $T_{amb} \leq 25\text{ °C}$ ; note 1 | —    | 250  | mW   |
| $T_{stg}$ | storage temperature           |                                      | –65  | +150 | °C   |
| $T_j$     | junction temperature          |                                      | —    | 150  | °C   |
| $T_{amb}$ | operating ambient temperature |                                      | –65  | +150 | °C   |

## Note

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

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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.

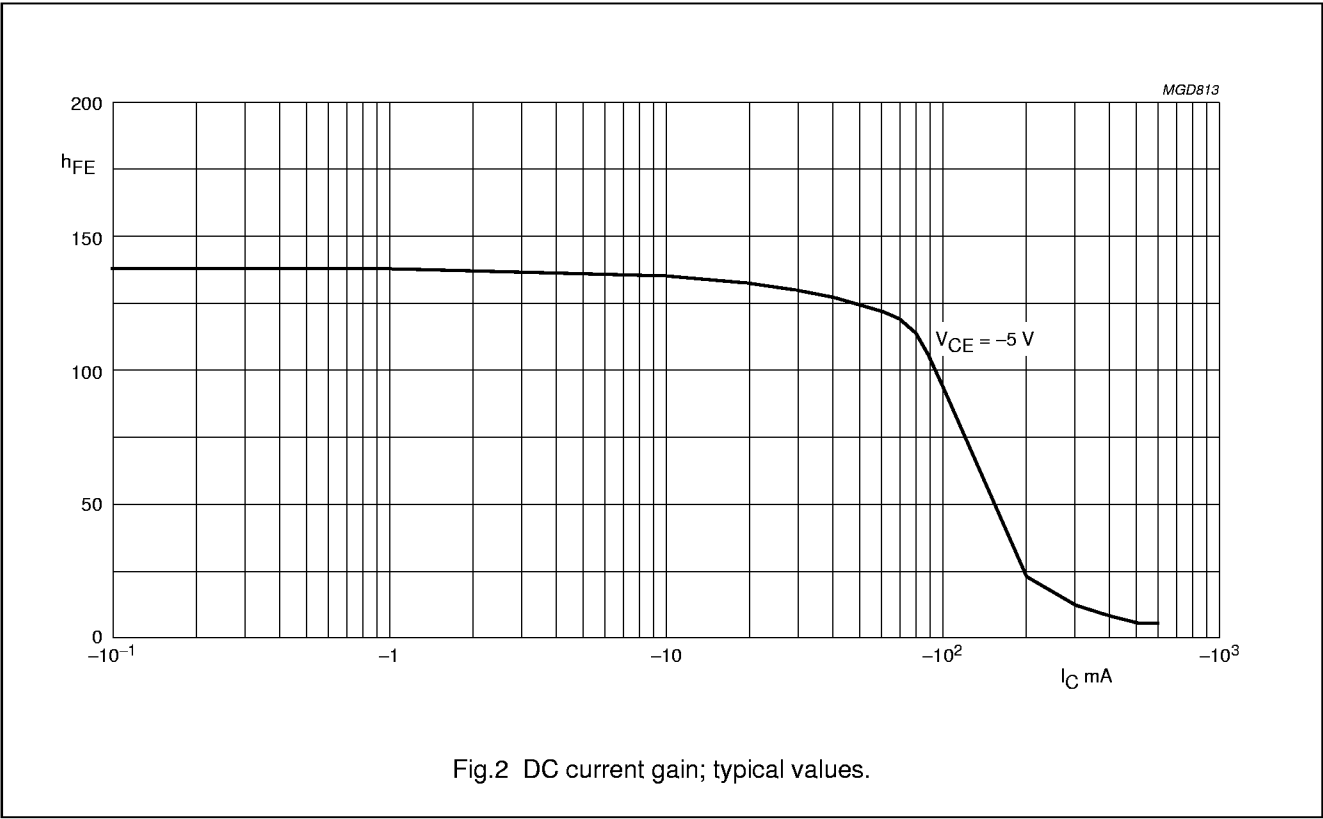
## CHARACTERISTICS

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

| SYMBOL      | PARAMETER                            | CONDITIONS                                                                                                                                      | MIN. | MAX. | UNIT          |
|-------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------|------|---------------|
| $I_{CBO}$   | collector cut-off current            | $I_E = 0; V_{CB} = -120\text{ V}$                                                                                                               | –    | –50  | nA            |
|             |                                      | $I_E = 0; V_{CB} = -120\text{ V}; T_{amb} = 150\text{ °C}$                                                                                      | –    | –50  | $\mu\text{A}$ |
| $I_{EBO}$   | emitter cut-off current              | $I_C = 0; V_{EB} = -4\text{ V}$                                                                                                                 | –    | –50  | nA            |
| $h_{FE}$    | DC current gain                      | $V_{CE} = -5\text{ V};$ (see Fig.2)                                                                                                             |      |      |               |
|             |                                      | $I_C = -1\text{ mA}$                                                                                                                            | 50   | –    |               |
|             |                                      | $I_C = -10\text{ mA}$                                                                                                                           | 60   | 240  |               |
|             |                                      | $I_C = -50\text{ mA}$                                                                                                                           | 50   | –    |               |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = -10\text{ mA}; I_B = -1\text{ mA}$                                                                                                       | –    | –200 | mV            |
|             |                                      | $I_C = -50\text{ mA}; I_B = -5\text{ mA}$                                                                                                       | –    | –500 | mV            |
| $V_{BEsat}$ | base-emitter saturation voltage      | $I_C = -10\text{ mA}; I_B = -1\text{ mA}$                                                                                                       | –    | –1   | V             |
|             |                                      | $I_C = -50\text{ mA}; I_B = -5\text{ mA}$                                                                                                       | –    | –1   | V             |
| $C_c$       | collector capacitance                | $I_E = I_{E0} = 0; V_{CB} = -10\text{ V}; f = 1\text{ MHz}$                                                                                     | –    | 6    | pF            |
| $f_T$       | transition frequency                 | $I_C = -10\text{ mA}; V_{CE} = -10\text{ V};$<br>$f = 100\text{ MHz}; T_{amb} = 25\text{ °C}$                                                   | 100  | 300  | MHz           |
| F           | noise figure                         | $I_C = -200\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; R_S = 2\text{ k}\Omega;$<br>$f = 10\text{ Hz to }15.7\text{ kHz}; T_{amb} = 25\text{ °C}$ | –    | 8    | dB            |

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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23

