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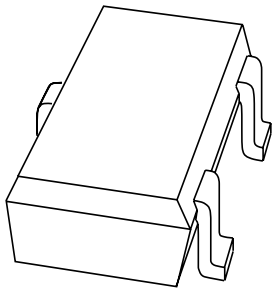
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Kind regards,

Team Nexperia

DATA SHEET



PMST3904 NPN switching transistor

Product data sheet
Supersedes data of 1999 Apr 22

2004 Jan 21

NPN switching transistor

PMST3904

FEATURES

- Collector current capability $I_C = 200 \text{ mA}$
- Collector-emitter voltage $V_{CEO} = 40 \text{ V}$.

APPLICATIONS

- General amplification and switching.

DESCRIPTION

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

MARKING

| TYPE NUMBER | MARKING CODE ⁽¹⁾ |
|-------------|-----------------------------|
| PMST3904 | *1A |

Note

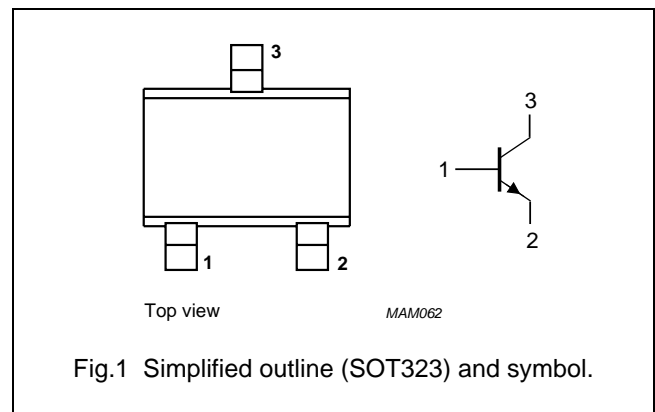
- * = p: Made in Hong Kong.
* = t: Made in Malaysia.
* = W: Made in China.

QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | UNIT |
|-----------|---------------------------|------|------|
| V_{CEO} | collector-emitter voltage | 40 | V |
| I_C | collector current (DC) | 200 | mA |

PINNING

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



ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | |
|-------------|---------|--|---------|
| | NAME | DESCRIPTION | VERSION |
| PMST3904 | - | plastic surface mounted package; 3 leads | SOT323 |

NPN switching transistor

PMST3904

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 | open base | – | 40 | V |
| V_{EBO} | emitter-base voltage | open collector | – | 6 | V |
| I_C | collector current (DC) | | – | 200 | mA |
| I_{CM} | peak collector current | | – | 200 | mA |
| I_{BM} | peak base current | | – | 100 | mA |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}$; note 1 | – | 200 | 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.

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.

NPN switching transistor

PMST3904

CHARACTERISTICS

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

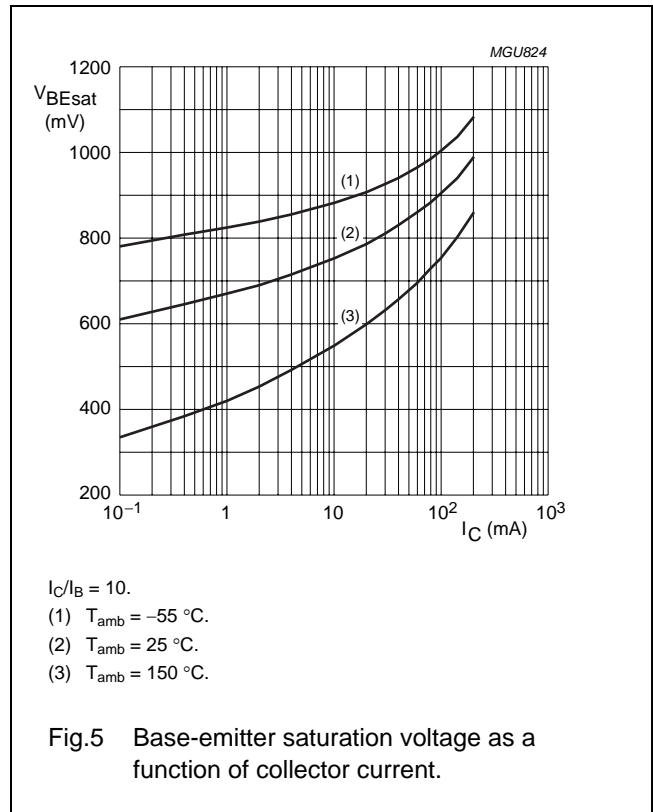
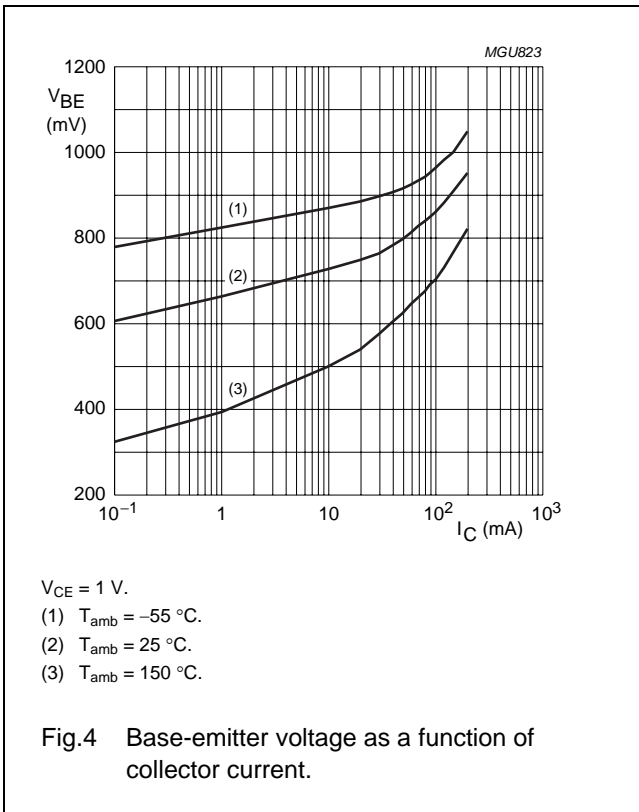
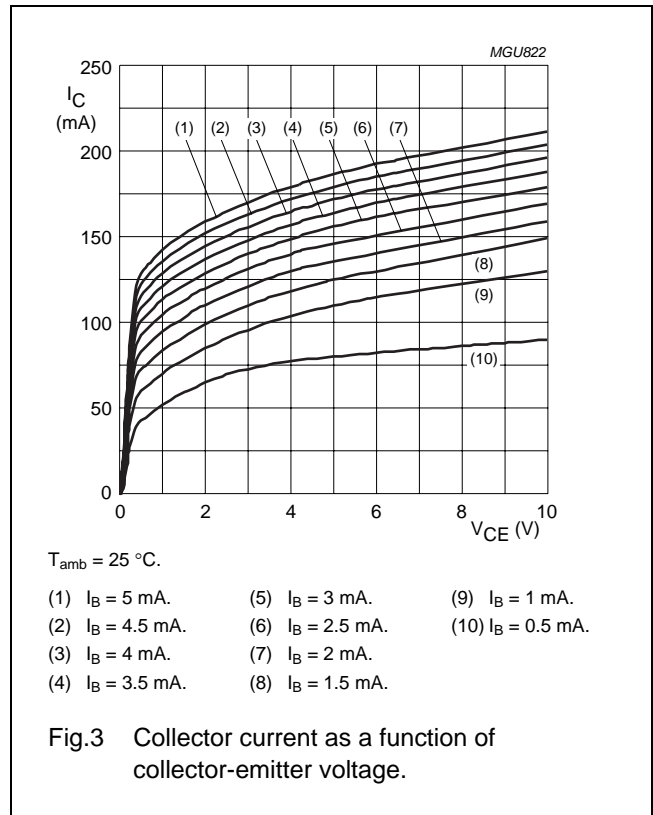
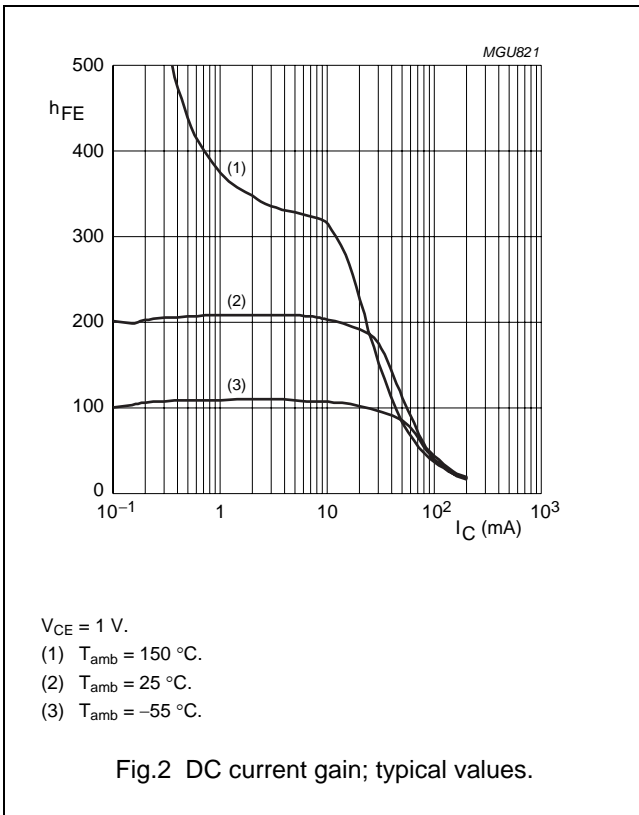
| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|--|--------------------------------------|--|-----------------------------|-------------------------|------|
| I_{CBO} | collector cut-off current | $I_E = 0; V_{CB} = 30\text{ V}$ | – | 50 | nA |
| I_{EBO} | emitter cut-off current | $I_C = 0; V_{EB} = 6\text{ V}$ | – | 50 | nA |
| h_{FE} | DC current gain | $V_{CE} = 1\text{ V}$; see Fig.2; note 1 $I_C = 0.1\text{ mA}$ $I_C = 1\text{ mA}$ $I_C = 10\text{ mA}$ $I_C = 50\text{ mA}$ $I_C = 100\text{ mA}$ | 60 80 100 60 30 | – – 300 – – | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = 10\text{ mA}; I_B = 1\text{ mA}$ | – | 200 | mV |
| | | $I_C = 50\text{ mA}; I_B = 5\text{ mA}$ | – | 300 | mV |
| V_{BEsat} | base-emitter saturation voltage | $I_C = 10\text{ mA}; I_B = 1\text{ mA}$ | 650 | 850 | mV |
| | | $I_C = 50\text{ mA}; I_B = 5\text{ mA}$ | – | 950 | mV |
| C_c | collector capacitance | $I_E = I_e = 0; V_{CB} = 5\text{ V}; f = 1\text{ MHz}$ | – | 4 | pF |
| C_e | emitter capacitance | $I_C = I_c = 0; V_{BE} = 500\text{ mV}; f = 1\text{ MHz}$ | – | 8 | pF |
| f_T | transition frequency | $I_C = 10\text{ mA}; V_{CE} = 20\text{ V}; f = 100\text{ MHz}$ | 300 | – | MHz |
| F | noise figure | $I_C = 100\text{ }\mu\text{A}; V_{CE} = 5\text{ V}; R_S = 1\text{ k}\Omega; f = 10\text{ Hz to }15.7\text{ kHz}$ | – | 5 | dB |
| Switching times (between 10% and 90% levels); see Fig.7 | | | | | |
| t_d | delay time | $I_{Con} = 10\text{ mA}; I_{Bon} = 1\text{ mA}; I_{Boff} = -1\text{ mA}$ | – | 35 | ns |
| t_r | rise time | | – | 35 | ns |
| t_s | storage time | | – | 200 | ns |
| t_f | fall time | | – | 50 | ns |

Note

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

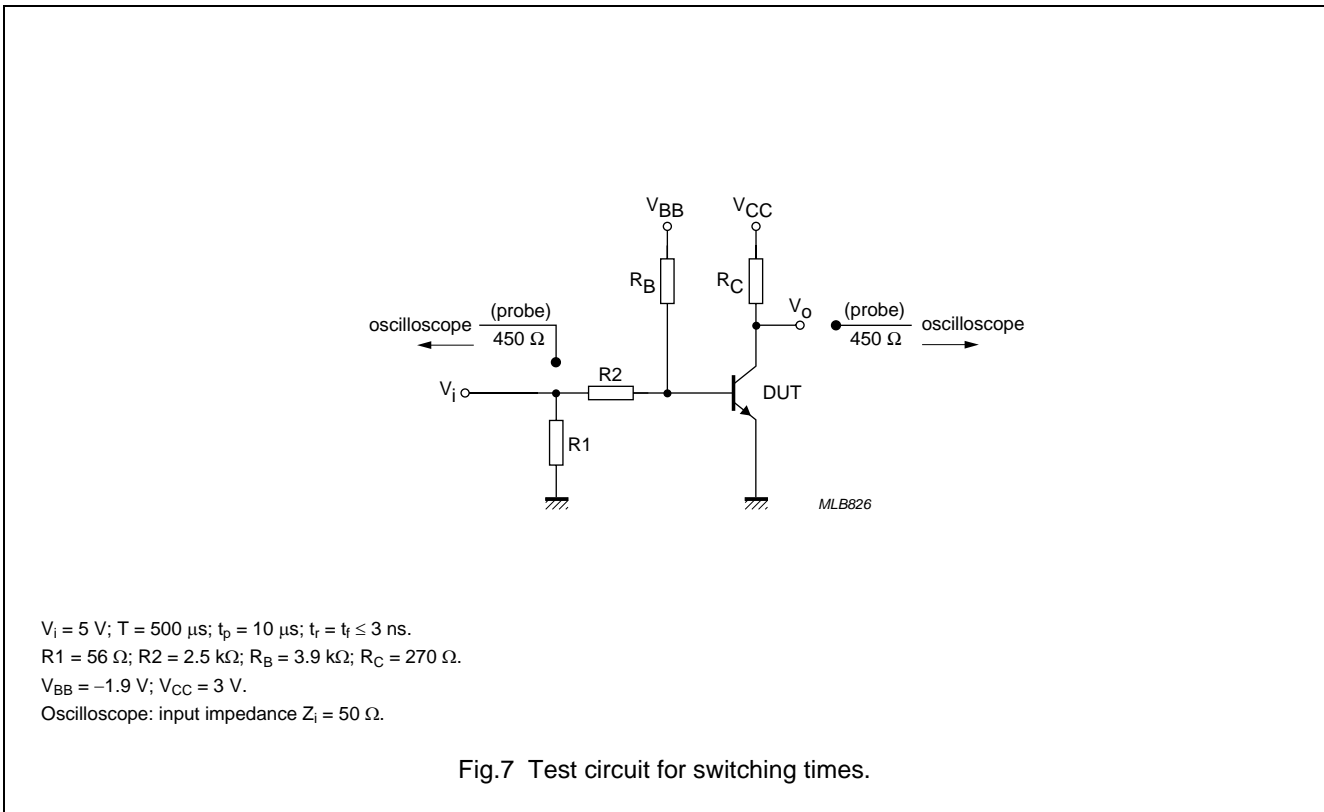
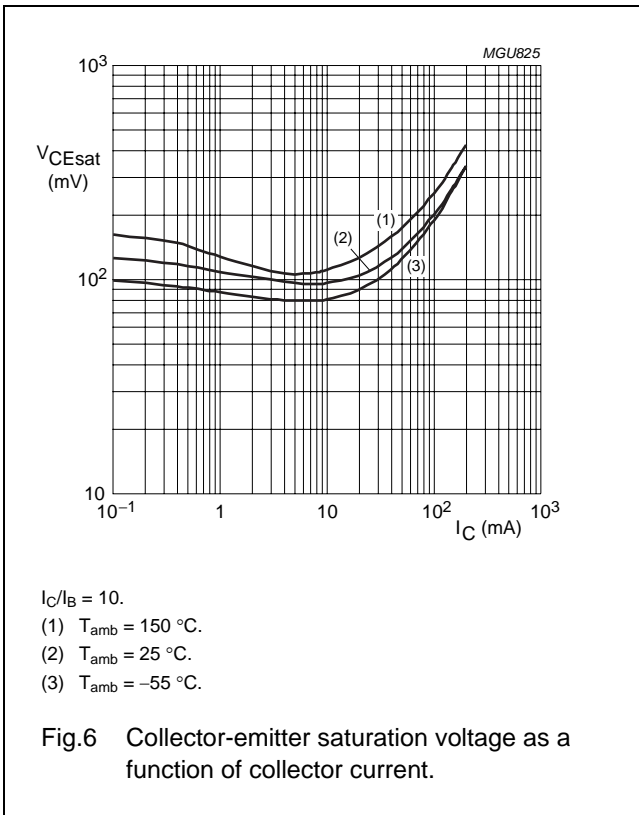
NPN switching transistor

PMST3904



NPN switching transistor

PMST3904



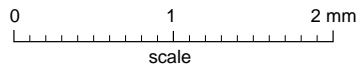
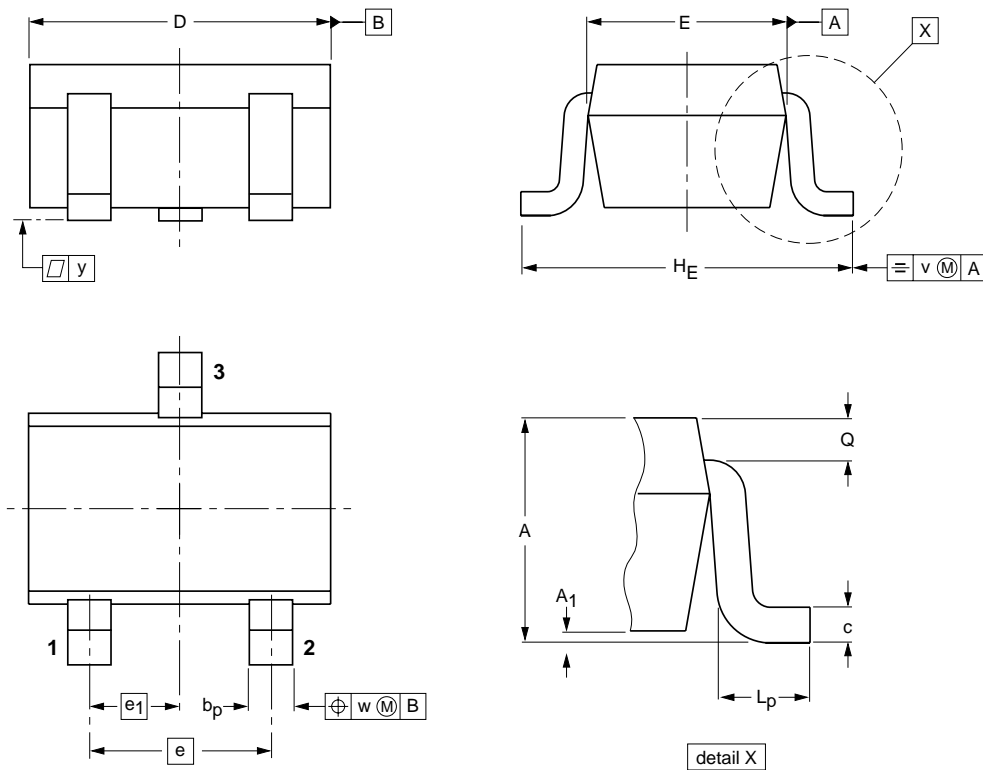
NPN switching transistor

PMST3904

PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT323



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 0.8 | 0.1 | 0.4 0.3 | 0.25 0.10 | 2.2 1.8 | 1.35 1.15 | 1.3 | 0.65 | 2.2 2.0 | 0.45 0.15 | 0.23 0.13 | 0.2 | 0.2 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|-------|-------|--|---------------------|---------------------------------|
| | IEC | JEDEC | JEITA | | | |
| SOT323 | | | SC-70 | | | 04-11-04 06-03-16 |

NPN switching transistor

PMST3904

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. |

Notes

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2. The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

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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>

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