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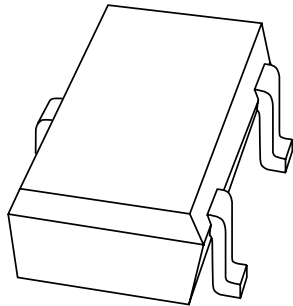
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Kind regards,

Team Nexperia

DATA SHEET



PMSS3906 PNP switching transistor

Product data sheet
Supersedes data of 1999 Apr 22

2004 Jan 09

PNP switching transistor

PMSS3906

FEATURES

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

APPLICATIONS

- Switching, e.g. telephony and professional communication equipment.

DESCRIPTION

PNP switching transistor in an SOT323 (SC-70) plastic package. NPN complement: PMSS3904.

QUICK REFERENCE DATA

| SYMBOL | PARAMETER | TYP. | MAX. | UNIT |
|-----------|---------------------------|------|------|------|
| V_{CEO} | collector-emitter voltage | – | –40 | V |
| I_C | collector current | – | –100 | mA |
| h_{FE} | DC current gain | 100 | 300 | |

PRODUCT OVERVIEW

| TYPE NUMBER | PACKAGE | | MARKING CODE ⁽¹⁾ | NPN COMPLEMENT |
|-------------|---------|-------|-----------------------------|----------------|
| | PHILIPS | EIAJ | | |
| PMSS3906 | SOT323 | SC-70 | 06* | PMSS3904 |

Note

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

SIMPLIFIED OUTLINE, SYMBOL AND PINNING

| TYPE NUMBER | SIMPLIFIED OUTLINE AND SYMBOL | PINNING | |
|-------------|-------------------------------|-------------|------------------------------|
| | | PIN | DESCRIPTION |
| PMSS3906 | <p>Top view</p> <p>MAM048</p> | 1 2 3 | base emitter collector |

PNP switching transistor

PMSS3906

ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | |
|-------------|---------|--|---------|
| | NAME | DESCRIPTION | VERSION |
| PMSS3906 | – | plastic surface mounted package; 3 leads | SOT323 |

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 (DC) | | – | –100 | mA |
| I_{CM} | peak collector current | | – | –200 | mA |
| I_{BM} | peak base current | | – | –100 | mA |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}$; notes 1 and 2 | – | 200 | mW |
| T_{stg} | storage temperature | | –65 | +150 | °C |
| T_j | junction temperature | | – | 150 | °C |
| T_{amb} | operating ambient temperature | | –65 | +150 | °C |

Notes

1. Refer to standard mounting conditions.
2. Transistor mounted on an FR4 printed-circuit board, single-sided copper, tinplated, standard footprint.

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------|---|---------------|-------|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | notes 1 and 2 | 625 | K/W |

Notes

1. Refer to standard mounting conditions.
2. Transistor mounted on an FR4 printed-circuit board, single-sided copper, tinplated, standard footprint.

PNP switching transistor

PMSS3906

CHARACTERISTICS

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

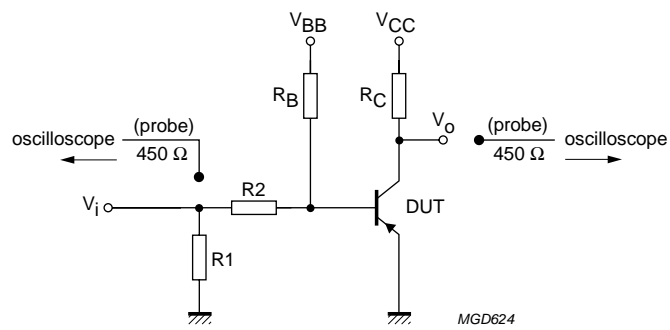
| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|--|--------------------------------------|---|------|------|---------------|
| I_{CBO} | collector-base cut-off current | $I_E = 0; V_{CB} = -30\text{ V}$ | – | –50 | nA |
| | | $I_E = 0; V_{CB} = -30\text{ V}; T_j = 150\text{ °C}$ | – | –10 | μA |
| I_{EBO} | emitter-base cut-off current | $I_C = 0; V_{EB} = -5\text{ V}$ | – | –50 | nA |
| h_{FE} | DC current gain | $V_{CE} = -1\text{ V}$ | | | |
| | | $I_C = -0.1\text{ mA}$ | 60 | – | |
| | | $I_C = -1\text{ mA}$ | 80 | – | |
| | | $I_C = -10\text{ mA}$ | 100 | 300 | |
| | | $I_C = -50\text{ mA}; \text{note 1}$ | 60 | – | |
| | | $I_C = -100\text{ mA}; \text{note 1}$ | 30 | – | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = -10\text{ mA}; I_B = -1\text{ mA}$ | – | –250 | mV |
| | | $I_C = -50\text{ mA}; I_B = -5\text{ mA}; \text{note 1}$ | – | –400 | mV |
| V_{BEsat} | base-emitter saturation voltage | $I_C = -10\text{ mA}; I_B = -1\text{ mA}$ | – | –850 | mV |
| | | $I_C = -50\text{ mA}; I_B = -5\text{ mA}; \text{note 1}$ | – | –950 | mV |
| C_c | collector capacitance | $I_E = i_e = 0; V_{CB} = -5\text{ V}; f = 1\text{ MHz}$ | – | 4.5 | pF |
| C_e | emitter capacitance | $I_C = i_c = 0; V_{EB} = -0.5\text{ V}; f = 1\text{ MHz}$ | – | 14 | pF |
| f_T | transition frequency | $I_E = -10\text{ mA}; V_{CB} = -20\text{ V}; f = 100\text{ MHz}$ | 150 | – | MHz |
| F | noise figure | $I_C = -100\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; R_S = 1\text{ k}\Omega;$ $f = 10\text{ Hz to }15.7\text{ kHz}$ | – | 4 | dB |
| Switching times (between 10% and 90% levels); see Fig.1 | | | | | |
| 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: $t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02$.

PNP switching transistor

PMSS3906



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

Fig.1 Test circuit for switching times.

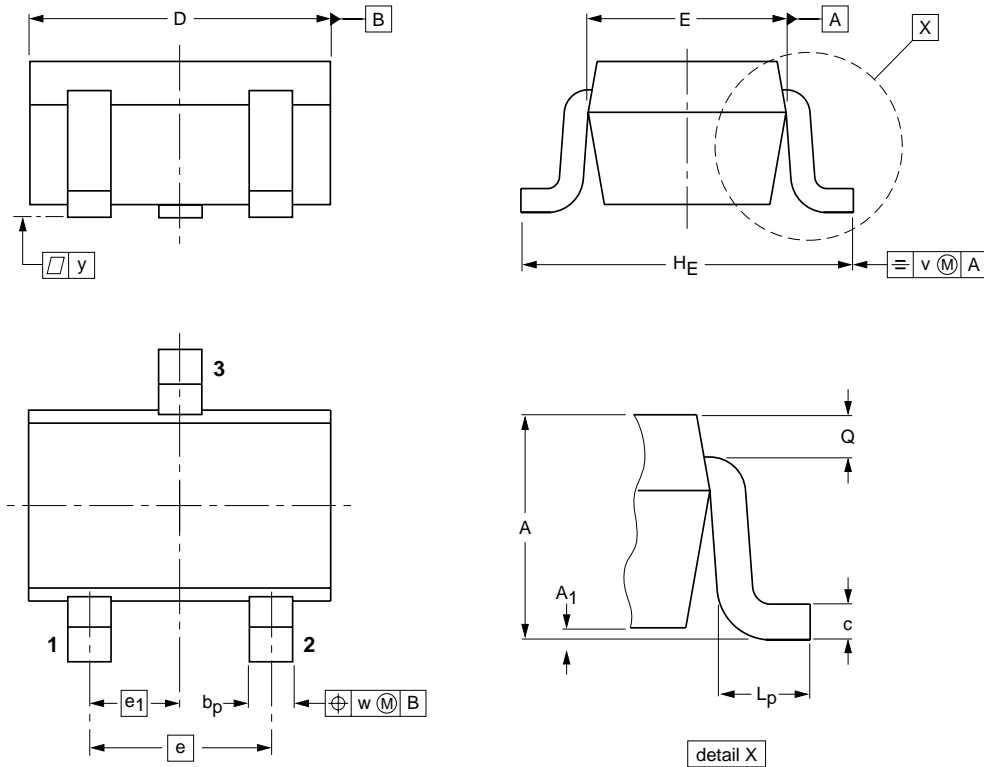
PNP switching transistor

PMSS3906

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 |

PNP switching transistor

PMSS3906

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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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

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Printed in The Netherlands

R75/04/pp8

Date of release: 2004 Jan 09

Document order number: 9397 750 12329

