

DATA SHEET

PEMH4; PUMH4

**NPN/NPN resistor-equipped
transistors; R1 = 10 k Ω , R2 = open**

Product data sheet
Supersedes data of 2003 Oct 02

2004 Apr 14

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FEATURES

- Built-in bias resistors
- Simplified circuit design
- Reduction of component count
- Reduced pick and place costs.

APPLICATIONS

- Low current peripheral driver
- Replacement of general purpose transistors in digital applications
- Control of IC inputs.

QUICK REFERENCE DATA

| SYMBOL | PARAMETER | TYP. | MAX. | UNIT |
|------------------|---------------------------|------|------|------------|
| V _{CEO} | collector-emitter voltage | – | 50 | V |
| I _O | output current (DC) | – | 100 | mA |
| TR1 | NPN | – | – | – |
| TR2 | NPN | – | – | – |
| R1 | bias resistor | 10 | – | k Ω |
| R2 | bias resistor | open | – | – |

DESCRIPTION

NPN/NPN resistor-equipped transistors (see “Simplified outline, symbol and pinning” for package details).

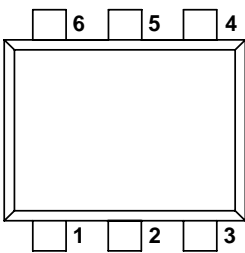
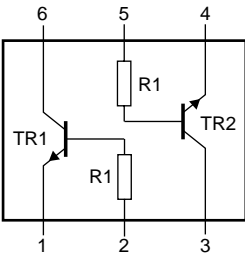
PRODUCT OVERVIEW

| TYPE NUMBER | PACKAGE | | MARKING CODE ⁽¹⁾ | NPN/PNP COMPLEMENT | PNP/PNP COMPLEMENT |
|-------------|---------|-------|-----------------------------|--------------------|--------------------|
| | PHILIPS | EIAJ | | | |
| PEMH4 | SOT666 | – | H4 | PEMD4 | PEMB4 |
| PUMH4 | SOT363 | SC-88 | H*4 | PUMD4 | PUMB4 |

Note

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

SIMPLIFIED OUTLINE, SYMBOL AND PINNING

| TYPE NUMBER | SIMPLIFIED OUTLINE AND SYMBOL | PINNING | |
|----------------|--|----------------------------|--|
| | | PIN | DESCRIPTION |
| PEMH4 PUMH4 |  <p>Top view</p>  <p>MAM453</p> | 1 2 3 4 5 6 | emitter TR1 base TR1 collector TR2 emitter TR2 base TR2 collector TR1 |

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ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | |
|-------------|---------|--|---------|
| | NAME | DESCRIPTION | VERSION |
| PEMH4 | – | Plastic surface mounted package; 6 leads | SOT666 |
| PUMH4 | – | Plastic surface mounted package; 6 leads | SOT363 |

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-----------------------|-------------------------------|--------------------------|------|------|------|
| Per transistor | | | | | |
| V _{CBO} | collector-base voltage | open emitter | – | 50 | V |
| V _{CEO} | collector-emitter voltage | open base | – | 50 | V |
| V _{EBO} | emitter-base voltage | open collector | – | 5 | V |
| I _O | output current (DC) | | – | 100 | mA |
| I _{CM} | peak collector current | | – | 100 | mA |
| P _{tot} | total power dissipation | T _{amb} ≤ 25 °C | | | |
| | SOT363 | note 1 | – | 200 | mW |
| | SOT666 | 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 |
| Per device | | | | | |
| P _{tot} | total power dissipation | T _{amb} ≤ 25 °C | | | |
| | SOT363 | note 1 | – | 300 | mW |
| | SOT666 | notes 1 and 2 | – | 300 | mW |

Notes

- Device mounted on an FR4 printed-circuit board, single-sided copper, standard footprint.
- Reflow soldering is the only recommended soldering method.

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THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|-----------------------|---|--------------------------|-------|------|
| Per transistor | | | | |
| R _{th(j-a)} | thermal resistance from junction to ambient | T _{amb} ≤ 25 °C | | |
| | SOT363 | note 1 | 625 | K/W |
| | SOT666 | notes 1 and 2 | 625 | K/W |
| Per device | | | | |
| R _{th(j-a)} | thermal resistance from junction to ambient | T _{amb} ≤ 25 °C | | |
| | SOT363 | note 1 | 416 | K/W |
| | SOT666 | notes 1 and 2 | 416 | K/W |

Notes

- Device mounted on an FR4 printed-circuit board, single-sided copper, standard footprint.
- Reflow soldering is the only recommended soldering method.

CHARACTERISTICS

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

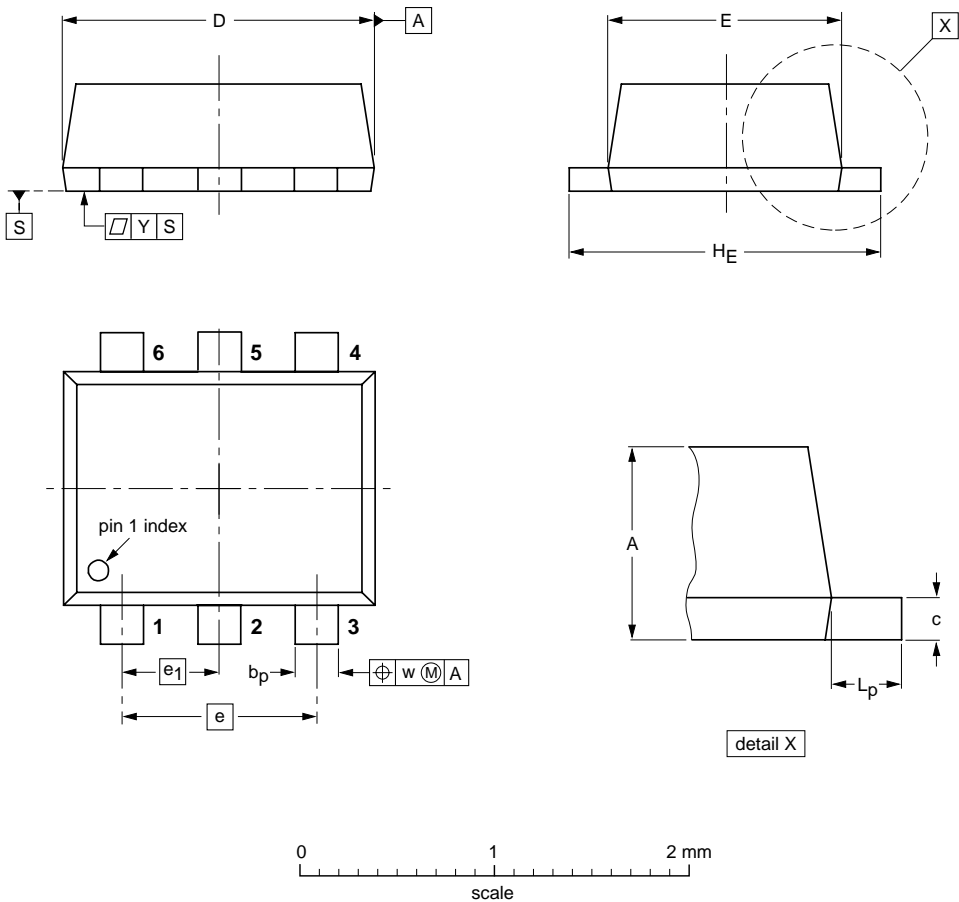
| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------------------|--------------------------------------|--|------|------|------|------------|
| Per transistor | | | | | | |
| I _{CBO} | collector-base cut-off current | V _{CB} = 50 V; I _E = 0 | – | – | 100 | nA |
| I _{CEO} | collector-emitter cut-off current | V _{CE} = 30 V; I _B = 0 | – | – | 1 | μA |
| | | V _{CE} = 30 V; I _B = 0; T _J = 150 °C | – | – | 50 | μA |
| I _{EBO} | emitter-base cut-off current | V _{EB} = 5 V; I _C = 0 | – | – | 100 | nA |
| h _{FE} | DC current gain | V _{CE} = 5 V; I _C = 1 mA | 200 | – | – | |
| V _{CEsat} | collector-emitter saturation voltage | I _C = 10 mA; I _B = 0.5 mA | – | – | 150 | mV |
| R1 | input resistor | | 7 | 10 | 13 | k Ω |
| C _c | collector capacitance | V _{CB} = 10 V; I _E = I _e = 0; f = 1 MHz | – | – | 2.5 | pF |

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PACKAGE OUTLINE

Plastic surface-mounted package; 6 leads
SOT666



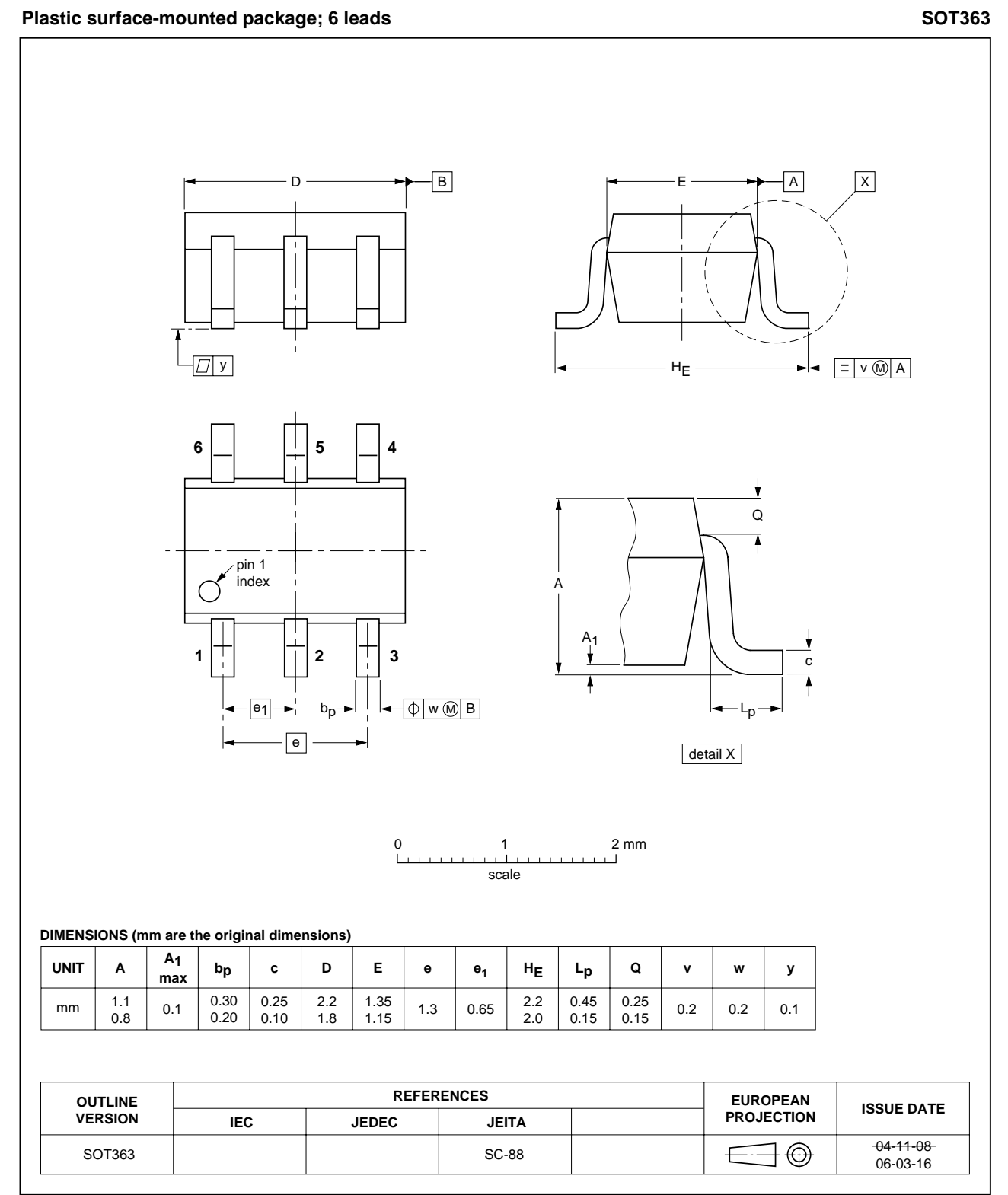
DIMENSIONS (mm are the original dimensions)

| UNIT | A | b _p | c | D | E | e | e ₁ | H _E | L _p | w | y |
|------|------------|----------------|--------------|------------|------------|-----|----------------|----------------|----------------|-----|-----|
| mm | 0.6 0.5 | 0.27 0.17 | 0.18 0.08 | 1.7 1.5 | 1.3 1.1 | 1.0 | 0.5 | 1.7 1.5 | 0.3 0.1 | 0.1 | 0.1 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|-------|-------|--|------------------------|----------------------|
| | IEC | JEDEC | JEITA | | | |
| SOT666 | | | | | | 04-11-08 06-03-16 |

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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

R75/05/pp8

Date of release: 2004 Apr 14

Document order number: 9397 750 13086

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