

DATA SHEET

PEMD6; PUMD6

NPN/PNP resistor-equipped
transistors;

R1 = 4.7 k Ω , R2 = open

Product data sheet
Supersedes data of 2003 Nov 04

2004 Apr 07

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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.

DESCRIPTION

NPN/PNP resistor-equipped transistors (see “_Data_Sheet_Remark Supersedes data of 2003 Nov 04” for package details).

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 | PNP | — | — | — |
| R1 | bias resistor | 4.7 | — | k Ω |
| R2 | open | — | — | — |

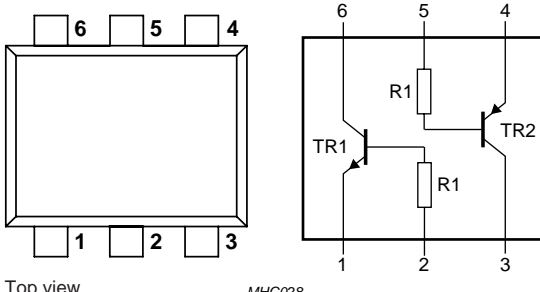
PRODUCT OVERVIEW

| TYPE NUMBER | PACKAGE | | MARKING CODE | NPN/PNP COMPLEMENT | PNP/PNP COMPLEMENT |
|-------------|---------|-------|--------------------|--------------------|--------------------|
| | PHILIPS | EIAJ | | | |
| PEMD6 | SOT666 | — | D6 | PEMH7 | PEMB3 |
| PUMD6 | SOT363 | SC-88 | D*6 ⁽¹⁾ | PUMH7 | PUMB3 |

Note

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

SIMPLIFIED OUTLINE, SYMBOL AND PINNING

| TYPE NUMBER | SIMPLIFIED OUTLINE AND SYMBOL | PINNING | |
|--------------|---|----------------------------|--|
| | | PIN | DESCRIPTION |
| PEMD6; PUMD6 |  <p>Top view</p> <p>MHC028</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 |
| PEMD6 | – | plastic surface mounted package; 6 leads | SOT666 |
| PUMD6 | – | 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; for the PNP transistor with negative polarity | | | | | |
| 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; note 1 | | | |
| | 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; note 1 | | | |
| | SOT363 | note 1 | – | 300 | mW |
| | SOT666 | notes 1 and 2 | – | 300 | mW |

Notes

1. Transistor mounted on an FR4 printed-circuit board, single-sided copper, standard footprint.
2. 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 | note 1 | | |
| | SOT363 | | 625 | K/W |
| | SOT666 | | 625 | K/W |
| Per device | | | | |
| R _{th(j-a)} | thermal resistance from junction to ambient | note 1 | | |
| | SOT363 | | 416 | K/W |
| | SOT666 | | 416 | K/W |

Note

1. Transistor mounted on an FR4 printed-circuit board, single-sided copper, standard footprint.

CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|--|--------------------------------------|--|------|------|------|------------|
| Per transistor; for the PNP transistor with negative polarity | | | | | | |
| 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 | μ A |
| | | V _{CE} = 30 V; I _B = 0; T _j = 150 °C | – | – | 50 | μ A |
| 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 = 5 mA; I _B = 0.25 mA | – | – | 100 | mV |
| R1 | input resistor | | 3.3 | 4.7 | 6.1 | k Ω |
| C _c | collector capacitance | I _E = I _e = 0; V _{CB} = 10 V; f = 1 MHz | | | | |
| | TR1 (NPN) | | – | – | 2.5 | pF |
| | TR2 (PNP) | | – | – | 3 | pF |

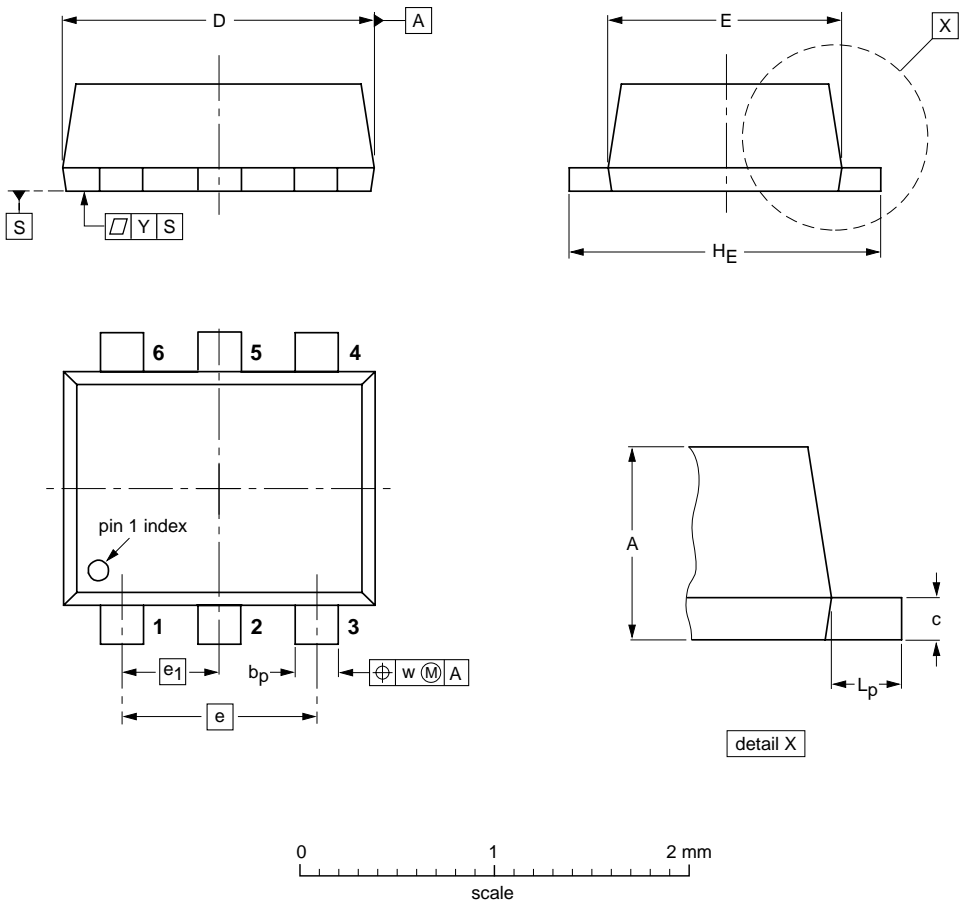
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PACKAGE OUTLINES

Plastic surface-mounted package; 6 leads

SOT666



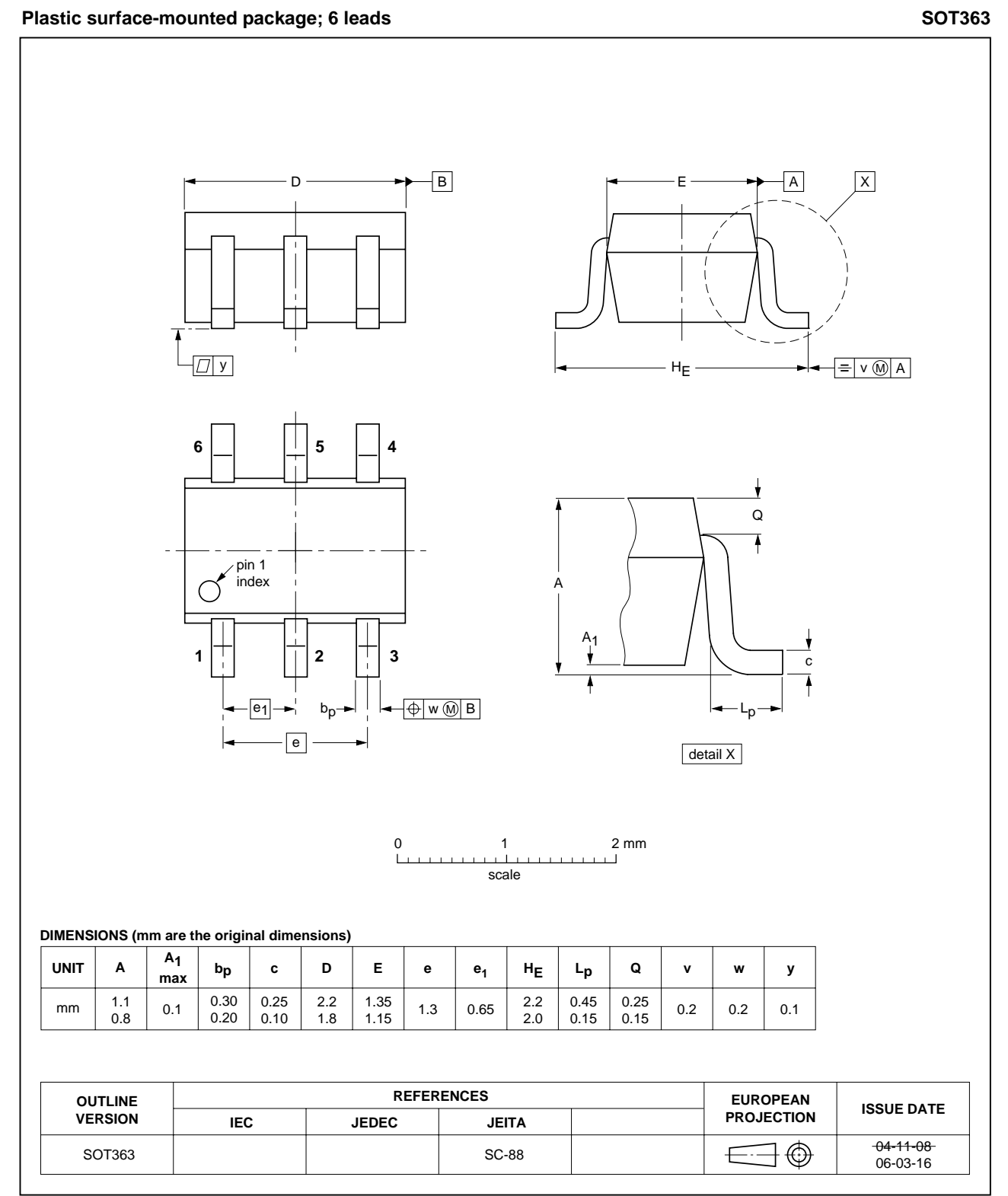
DIMENSIONS (mm are the original dimensions)

| 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. |

Notes

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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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