

DATA SHEET

PEMD6; PUMD6
NPN/PNP resistor-equipped
transistors;
R1 = 4.7 k Ω , R2 = open

Product specification
Supersedes data of 2003 Nov 04

2004 Apr 07

**NPN/PNP resistor-equipped transistors;
R1 = 4.7 kΩ, R2 = open**

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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 | – | kΩ |
| 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 MHC028</p> | 1 | emitter TR1 |
| | | 2 | base TR1 |
| | | 3 | collector TR2 |
| | | 4 | emitter TR2 |
| | | 5 | base TR2 |
| | | 6 | 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 | |

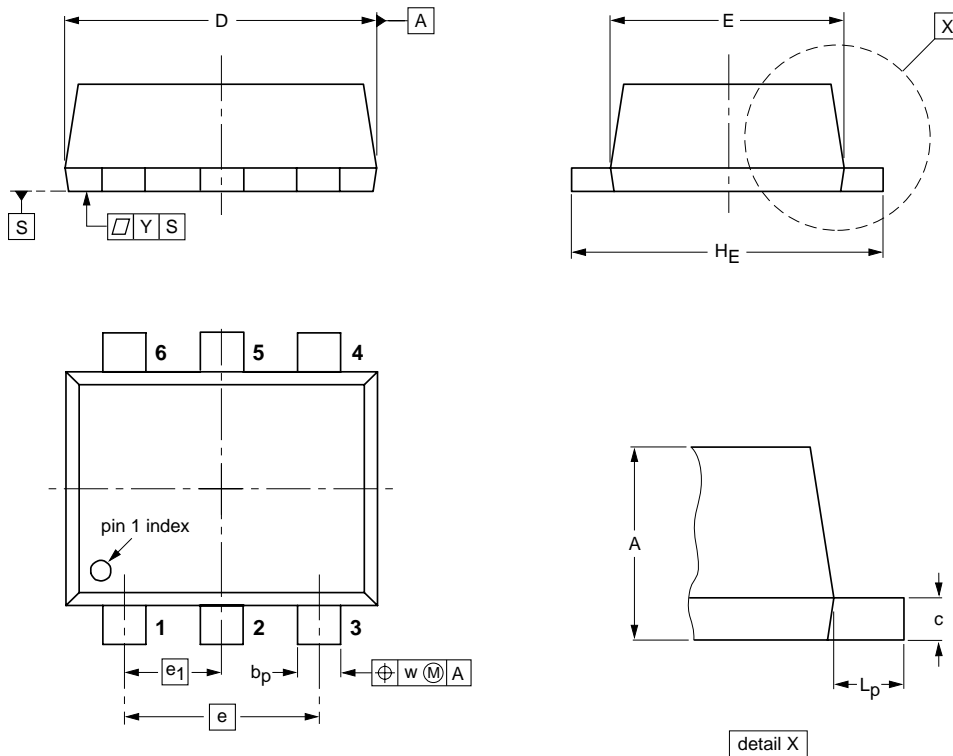
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PACKAGE OUTLINES

Plastic surface mounted package; 6 leads

SOT666



DIMENSIONS (mm are the original dimensions)

| UNIT | A | bp | 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 |

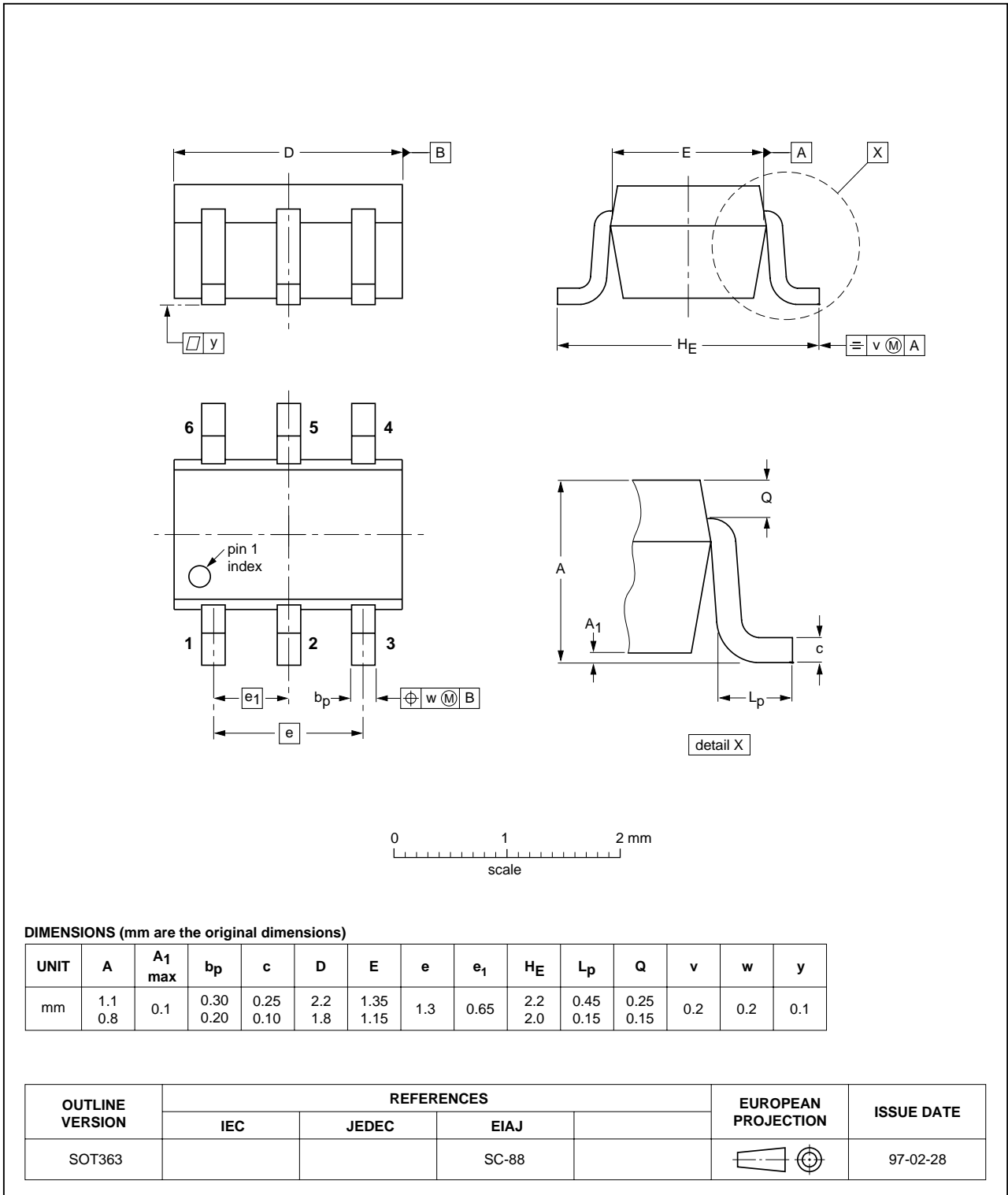
| OUTLINE VERSION | REFERENCES | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|-------|------|---------------------|----------------------|
| | IEC | JEDEC | EIAJ | | |
| SOT666 | | | | | 01-01-04 01-08-27 |

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| LEVEL | DATA SHEET STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾⁽³⁾ | DEFINITION |
|-------|----------------------------------|----------------------------------|--|
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