

DATA SHEET

PEMH7; PUMH7
NPN/NPN resistor-equipped
transistors; R1 = 4.7 k Ω , R2 = open

Product specification
Supersedes data of 2001 Oct 22

2003 Oct 02

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

PEMH7; PUMH7

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/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 | | | |
| PEMH7 | SOT666 | – | H3 | PEMD6 | PEMB3 |
| PUMH7 | SOT363 | SC-88 | H*7 | PUMD6 | 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 |
| PEMH7 PUMH7 | <p>Top view MAM453</p> | 1 | emitter TR1 |
| | | 2 | base TR1 |
| | | 3 | collector TR2 |
| | | 4 | emitter TR2 |
| | | 5 | base TR2 |
| | | 6 | collector TR1 |

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 | 4.7 | – | k Ω |
| R2 | bias resistor | open | – | – |

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ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | |
|-------------|---------|--|---------|
| | NAME | DESCRIPTION | VERSION |
| PEMH7 | – | Plastic surface mounted package; 6 leads | SOT666 |
| PUMH7 | – | 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

1. Device 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 | 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

1. Device mounted on an FR4 printed-circuit board, single-sided copper, standard footprint.
2. 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 | 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 | 330 | – | |
| 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 | V _{CB} = 10 V; I _E = i _e = 0; f = 1 MHz | – | – | 2.5 | pF |

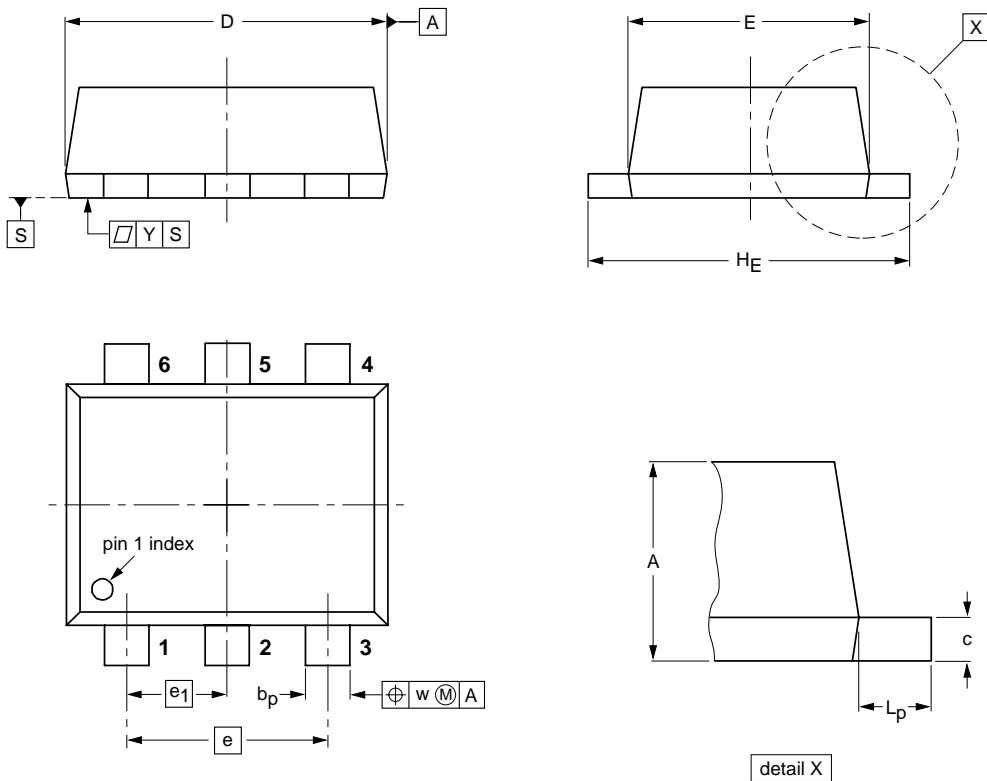
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PACKAGE OUTLINE

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 |

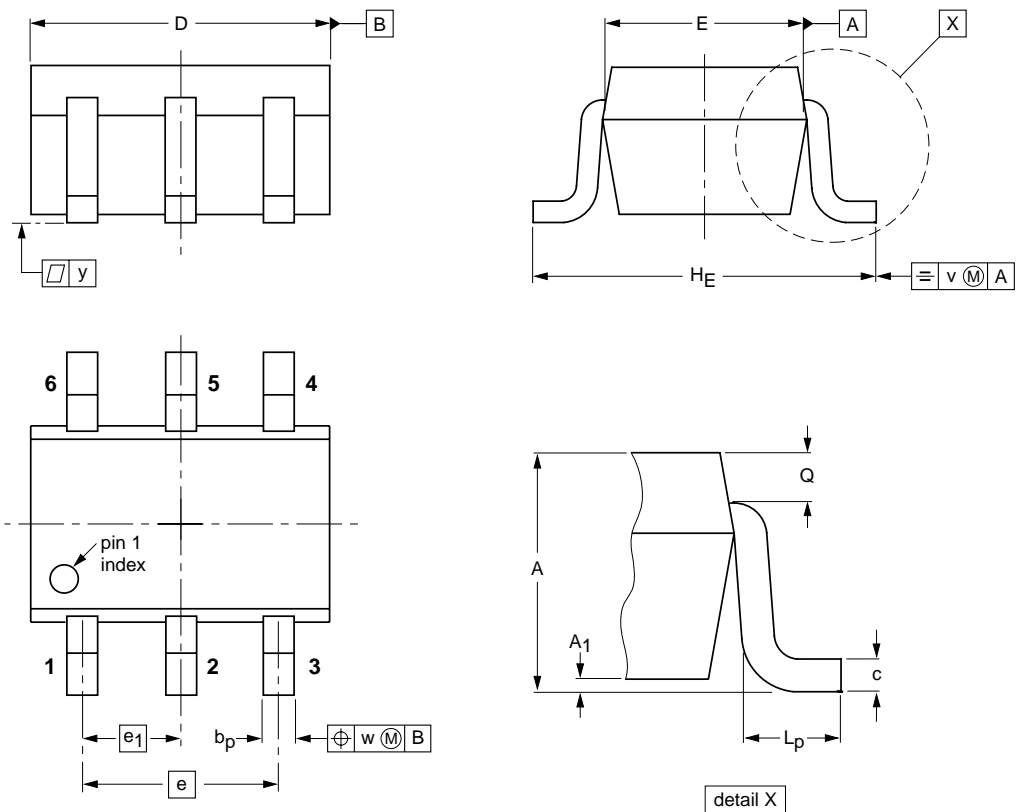
| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|-------|------|--|---------------------|----------------------|
| | IEC | JEDEC | EIAJ | | | |
| SOT666 | | | | | | 01-01-04 01-08-27 |

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DIMENSIONS (mm are the original dimensions)

| UNIT | A | A1 max | bp | c | D | E | e | e1 | HE | Lp | Q | v | w | y |
|------|------------|-----------|--------------|--------------|------------|--------------|-----|------|------------|--------------|--------------|-----|-----|-----|
| mm | 1.1 0.8 | 0.1 | 0.30 0.20 | 0.25 0.10 | 2.2 1.8 | 1.35 1.15 | 1.3 | 0.65 | 2.2 2.0 | 0.45 0.15 | 0.25 0.15 | 0.2 | 0.2 | 0.1 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|-------|-------|--|------------------------|------------|
| | IEC | JEDEC | EIAJ | | | |
| SOT363 | | | SC-88 | | | 97-02-28 |

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DATA SHEET STATUS

| LEVEL | DATA SHEET STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾⁽³⁾ | DEFINITION |
|-------|----------------------------------|----------------------------------|--|
| I | Objective data | Development | This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice. |
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Notes

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Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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Printed in The Netherlands

R75/03/pp8

Date of release: 2003 Oct 02

Document order number: 9397 750 11873

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