

# DATA SHEET



## **PEMD10**

**NPN/PNP resistor-equipped  
transistors;**

**$R1 = 2.2 \text{ k}\Omega$ ,  $R2 = 47 \text{ k}\Omega$**

Preliminary specification

2001 Sep 11

**NPN/PNP resistor-equipped transistors;**  
**R1 = 2.2 kΩ, R2 = 47 kΩ**

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**FEATURES**

- 300 mW total power dissipation
- Very small 1.6 × 1.2 mm ultra thin package
- Excellent coplanarity due to straight leads
- Replaces two SC-75/SC-89 packaged transistors on same PCB area
- Reduces required PCB area
- Reduced pick and place costs.

**APPLICATIONS**

- General purpose switching and amplification
- Inverter and interface circuits
- Circuit driver.

**DESCRIPTION**

NPN/PNP resistor-equipped transistors in a SOT666 plastic package.

**MARKING**

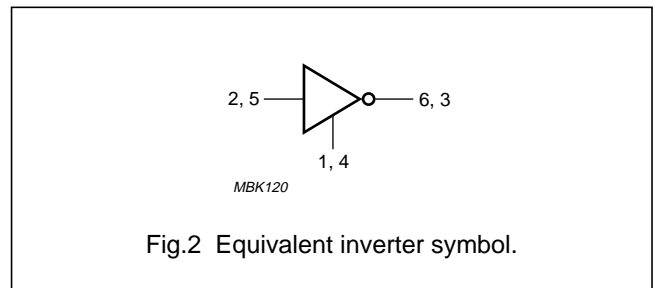
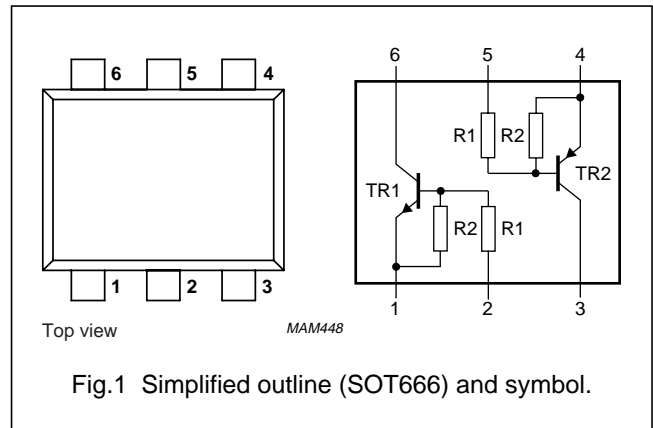
TYPE NUMBER	MARKING CODE
PEMD10	D1

**QUICK REFERENCE DATA**

SYMBOL	PARAMETER	MAX.	UNIT
V <sub>CEO</sub>	collector-emitter voltage	50	V
I <sub>CM</sub>	peak collector current	100	mA
R1	bias resistor	2.2	kΩ
R2	bias resistor	47	kΩ

**PINNING**

PIN	SYMBOL	DESCRIPTION
1, 4	TR1; TR2	emitter
2, 5	TR1; TR2	base
6, 3	TR1; TR2	collector



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PEMD10

**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
<b>Per transistor; for the PNP transistor with negative polarity</b>					
V <sub>CBO</sub>	collector-base voltage	open emitter	–	50	V
V <sub>CEO</sub>	collector-emitter voltage	open base	–	50	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	10	V
V <sub>I</sub>	input voltage TR1	positive	–	+12	V
		negative	–	–5	V
	input voltage TR2	positive	–	+5	V
		negative	–	–12	V
I <sub>O</sub>	output current (DC)		–	100	mA
I <sub>CM</sub>	peak collector current		–	100	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C; note 1	–	200	mW
T <sub>stg</sub>	storage temperature		–65	+150	°C
T <sub>j</sub>	junction temperature		–	150	°C
T <sub>amb</sub>	operating ambient temperature		–65	+150	°C
<b>Per device</b>					
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C; note 1	–	300	mW

**Note**

1. Transistor mounted on an FR4 printed-circuit board.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-a</sub>	thermal resistance from junction to ambient	notes 1 and 2	416	K/W

**Notes**

1. Transistor mounted on an FR4 printed-circuit board.
2. The only recommended soldering method is reflow soldering.

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PEMD10

**CHARACTERISTICS**

$T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ ; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Per transistor; for the PNP transistor with negative polarity</b>						
$I_{\text{CBO}}$	collector-base cut-off current	$V_{\text{CB}} = 50 \text{ V}$ ; $I_{\text{E}} = 0$	–	–	100	nA
$I_{\text{CEO}}$	collector-emitter cut-off current	$V_{\text{CE}} = 50 \text{ V}$ ; $I_{\text{B}} = 0$	–	–	1	$\mu\text{A}$
		$V_{\text{CE}} = 30 \text{ V}$ ; $I_{\text{B}} = 0$ ; $T_{\text{j}} = 150 \text{ }^\circ\text{C}$	–	–	50	$\mu\text{A}$
$I_{\text{EBO}}$	emitter-base cut-off current	$V_{\text{EB}} = 5 \text{ V}$ ; $I_{\text{C}} = 0$	–	–	180	$\mu\text{A}$
$h_{\text{FE}}$	DC current gain	$V_{\text{CE}} = 5 \text{ V}$ ; $I_{\text{C}} = 10 \text{ mA}$	100	–	–	
$V_{\text{CEsat}}$	collector-emitter saturation voltage	$I_{\text{C}} = 5 \text{ mA}$ ; $I_{\text{B}} = 0.25 \text{ mA}$	–	–	100	mV
$V_{\text{i(off)}}$	input off voltage	$V_{\text{CE}} = 5 \text{ V}$ ; $I_{\text{C}} = 100 \mu\text{A}$	–	0.6	0.5	V
$V_{\text{i(on)}}$	input on voltage	$V_{\text{CE}} = 0.3 \text{ V}$ ; $I_{\text{C}} = 5 \text{ mA}$	1.1	0.75	–	V
R1	input resistor		1.54	2.2	2.86	$\text{k}\Omega$
$\frac{R2}{R1}$	resistor ratio		17	21	26	
$C_{\text{c}}$	collector capacitance	$I_{\text{E}} = i_{\text{e}} = 0$ ; $V_{\text{CB}} = 10 \text{ V}$ ; $f = 1 \text{ MHz}$	–	–	2.5	pF
	TR1 (NPN)				3	pF
	TR2 (PNP)					

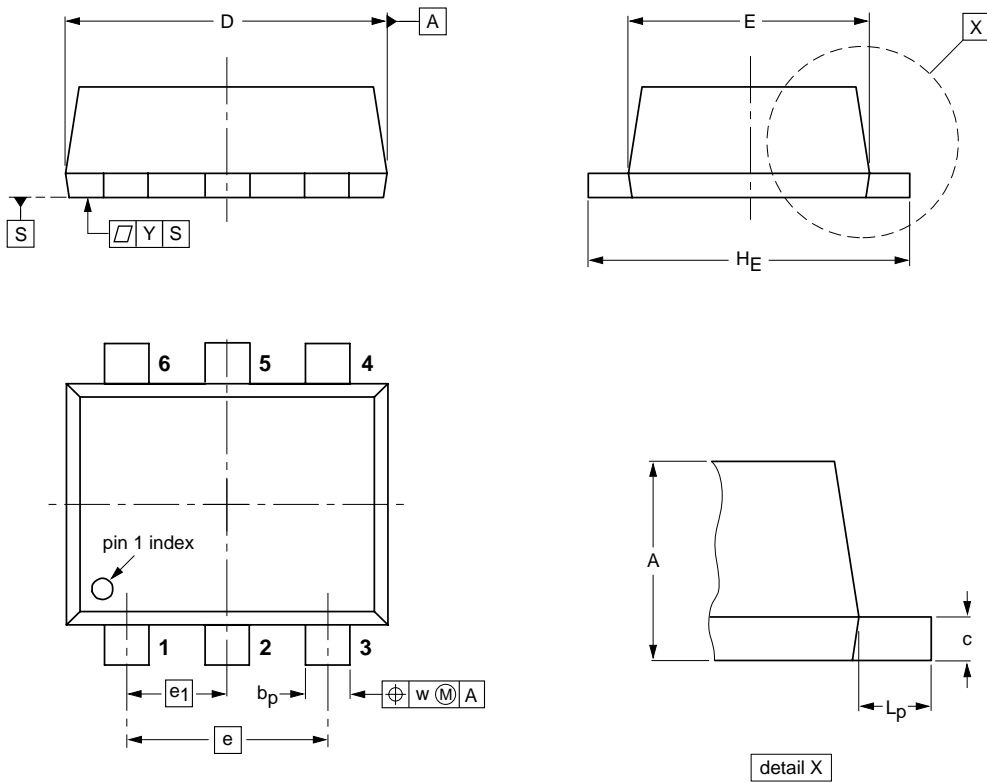
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PEMD10

PACKAGE OUTLINE

Plastic surface mounted package; 6 leads

SOT666



DIMENSIONS (mm are the original dimensions)

UNIT	A	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	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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PEMD10

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**NOTES**

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## **Contact information**

For additional information please visit <http://www.semiconductors.philips.com>. Fax: **+31 40 27 24825**

For sales offices addresses send e-mail to: [sales.addresses@www.semiconductors.philips.com](mailto:sales.addresses@www.semiconductors.philips.com).

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