

# DATA SHEET

## **PEMB1; PUMB1**

**PNP/PNP resistor-equipped  
transistors; R1 = 22 k $\Omega$ , R2 = 22 k $\Omega$**

Product data sheet  
Supersedes data of 2001 Sep 13

2003 Oct 15

# PNP/PNP resistor-equipped transistors; R1 = 22 k $\Omega$ , R2 = 22 k $\Omega$

PEMB1; PUMB1

## FEATURES

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

## APPLICATIONS

- Low current peripheral drivers
- Replacement of general purpose transistors in digital applications.

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	TYP.	MAX.	UNIT
V <sub>CEO</sub>	collector-emitter voltage	–	–50	V
I <sub>O</sub>	output current (DC)	–	–100	mA
TR1	PNP	–	–	–
TR2	PNP	–	–	–
R1	bias resistor	22	–	k $\Omega$
R2	bias resistor	22	–	k $\Omega$

## DESCRIPTION

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

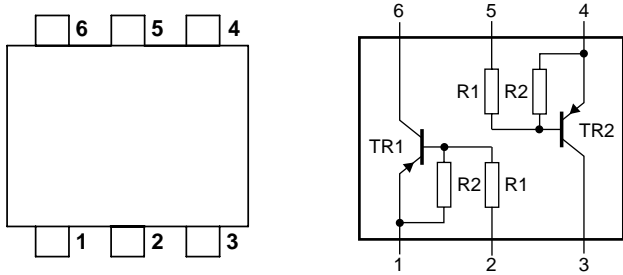
## PRODUCT OVERVIEW

TYPE NUMBER	PACKAGE		MARKING CODE	NPN/PNP COMPLEMENT	NPN/PNP COMPLEMENT
	PHILIPS	EIAJ			
PEMB1	SOT666	–	Z4	PEMD2	PEMH1
PUMB1	SOT363	SC-88	B*3 <sup>(1)</sup>	PUMD2	PUMH1

## Note

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

## SIMPLIFIED OUTLINE, SYMBOL AND PINNING

TYPE NUMBER	SIMPLIFIED OUTLINE AND SYMBOL	PINNING	
		PIN	DESCRIPTION
PEMB1 PUMB1	 <p>Top view</p> <p>MAM477</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
PEMB1	–	plastic surface mounted package; 6 leads	SOT666
PUMB1	–	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
<b>Per transistor</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				
	positive		–	+10	V
	negative		–	–40	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			
	SOT363	note 1	–	200	mW
	SOT666	notes 1 and 2	–	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			
	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
<b>Per transistor</b>				
R <sub>th j-a</sub>	thermal resistance from junction to ambient	T <sub>amb</sub> ≤ 25 °C		
	SOT363	note 1	625	K/W
	SOT666	notes 1 and 2	625	K/W
<b>Per device</b>				
R <sub>th j-a</sub>	thermal resistance from junction to ambient	T <sub>amb</sub> ≤ 25 °C		
	SOT363	note 1	416	K/W
	SOT666	note 1	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<sub>amb</sub> = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I <sub>CBO</sub>	collector-base cut-off current	V <sub>CB</sub> = -50 V; I <sub>E</sub> = 0	–	–	-100	nA
I <sub>CEO</sub>	collector-emitter cut-off current	V <sub>CE</sub> = -30 V; I <sub>B</sub> = 0	–	–	-1	μA
		V <sub>CE</sub> = -30 V; I <sub>B</sub> = 0; T <sub>j</sub> = 150 °C	–	–	-50	μA
I <sub>EBO</sub>	emitter-base cut-off current	V <sub>EB</sub> = -5 V; I <sub>C</sub> = 0	–	–	-180	μA
h <sub>FE</sub>	DC current gain	V <sub>CE</sub> = -5 V; I <sub>C</sub> = -5 mA	60	–	–	
V <sub>CEsat</sub>	saturation voltage	I <sub>C</sub> = -10 mA; I <sub>B</sub> = -0.5 mA	–	–	-150	mV
V <sub>i(off)</sub>	input-off voltage	V <sub>CE</sub> = -5 V; I <sub>C</sub> = -100 μA	–	-1.1	-0.8	V
V <sub>i(on)</sub>	input-on voltage	V <sub>CE</sub> = -0.3 V; I <sub>C</sub> = -5 mA	-2.5	-1.7	–	V
R1	input resistor		15.4	22	28.6	k $\Omega$
$\frac{R2}{R1}$	resistor ratio		0.8	1	1.2	
C <sub>c</sub>	collector capacitance	I <sub>E</sub> = I <sub>e</sub> = 0; V <sub>CB</sub> = -10 V; f = 1 MHz	–	–	3	pF

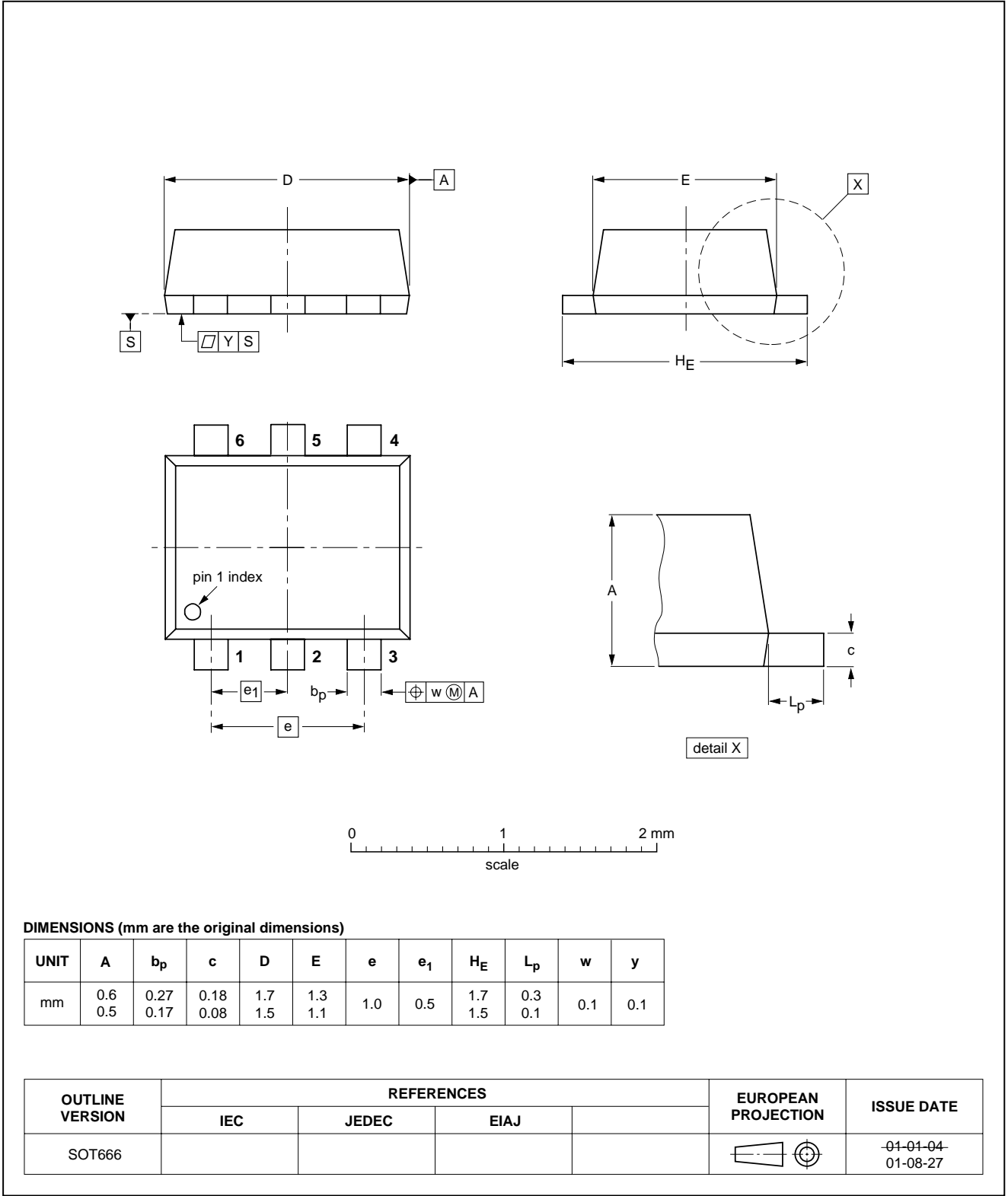
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R1 = 22 kΩ, R2 = 22 kΩ

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PACKAGE OUTLINES

Plastic surface mounted package; 6 leads

SOT666

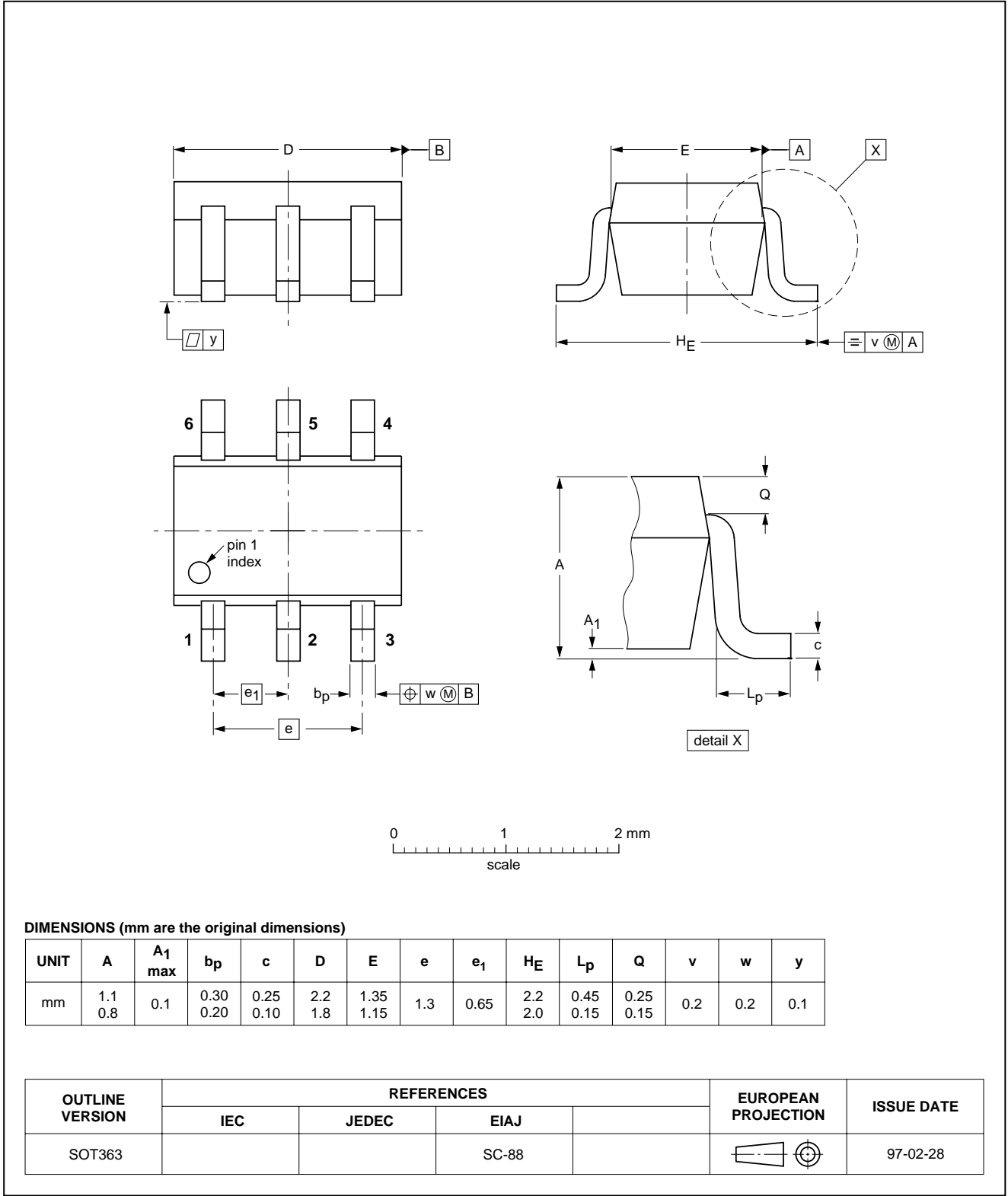


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## DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	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. No changes were made to the content, except for the legal definitions and disclaimers.

## **Contact information**

For additional information please visit: **<http://www.nxp.com>**

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