

# DATA SHEET

**PEMB10; PUMB10**  
PNP/PNP resistor-equipped  
transistors; R1 = 2.2 k $\Omega$ , R2 = 47 k $\Omega$

Product data sheet  
Supersedes data of 2001 Sep 14

2003 Oct 03

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

**PEMB10; PUMB10**

**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
- Control of IC inputs.

**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	2.2	–	kΩ
R2	bias resistor	47	–	kΩ

**DESCRIPTION**

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

**PRODUCT OVERVIEW**

TYPE NUMBER	PACKAGE		MARKING CODE <sup>(1)</sup>	NPN/PNP COMPLEMENT	NPN/PNP COMPLEMENT
	PHILIPS	EIAJ			
PEMB10	SOT666	–	Z5	PEMD10	PEMH10
PUMB10	SOT363	SC-88	B*0	PUMD10	PUMH10

**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
PEMB10 PUMB10	<p>Top view <span style="margin-left: 100px;">MAM477</span></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
PEMB10	–	plastic surface mounted package; 6 leads	SOT666
PUMB10	–	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		–	+5	V
			–	–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			
		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

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
<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	$\mu$ A
		V <sub>CE</sub> = -30 V; I <sub>B</sub> = 0; T <sub>j</sub> = 150 °C	-	-	-50	$\mu$ A
I <sub>EBO</sub>	emitter-base cut-off current	V <sub>EB</sub> = -5 V; I <sub>C</sub> = 0	-	-	-180	$\mu$ A
h <sub>FE</sub>	DC current gain	V <sub>CE</sub> = -5 V; I <sub>C</sub> = -10 mA	100	-	-	
V <sub>CEsat</sub>	saturation voltage	I <sub>C</sub> = -5 mA; I <sub>B</sub> = -0.25 mA	-	-	-100	mV
V <sub>i(off)</sub>	input-off voltage	V <sub>CE</sub> = -5 V; I <sub>C</sub> = -100 $\mu$ A	-	-0.6	-0.5	V
V <sub>i(on)</sub>	input-on voltage	V <sub>CE</sub> = -0.3 V; I <sub>C</sub> = -5 mA	-1.1	-0.75	-	V
R1	input resistor		1.54	2.2	2.86	k $\Omega$
$\frac{R2}{R1}$	resistor ratio		17	21	26	
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

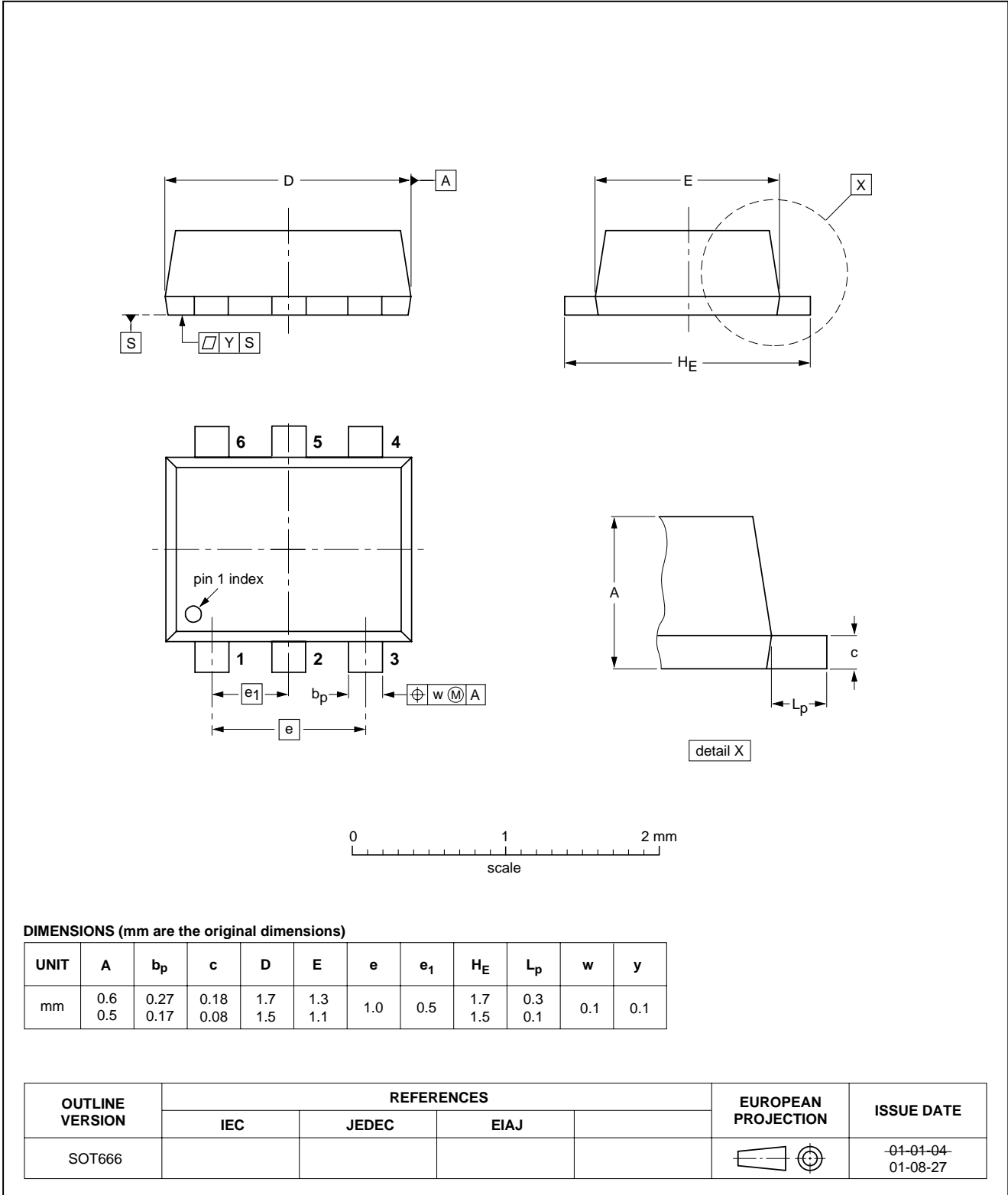
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PACKAGE OUTLINES

Plastic surface mounted package; 6 leads

SOT666

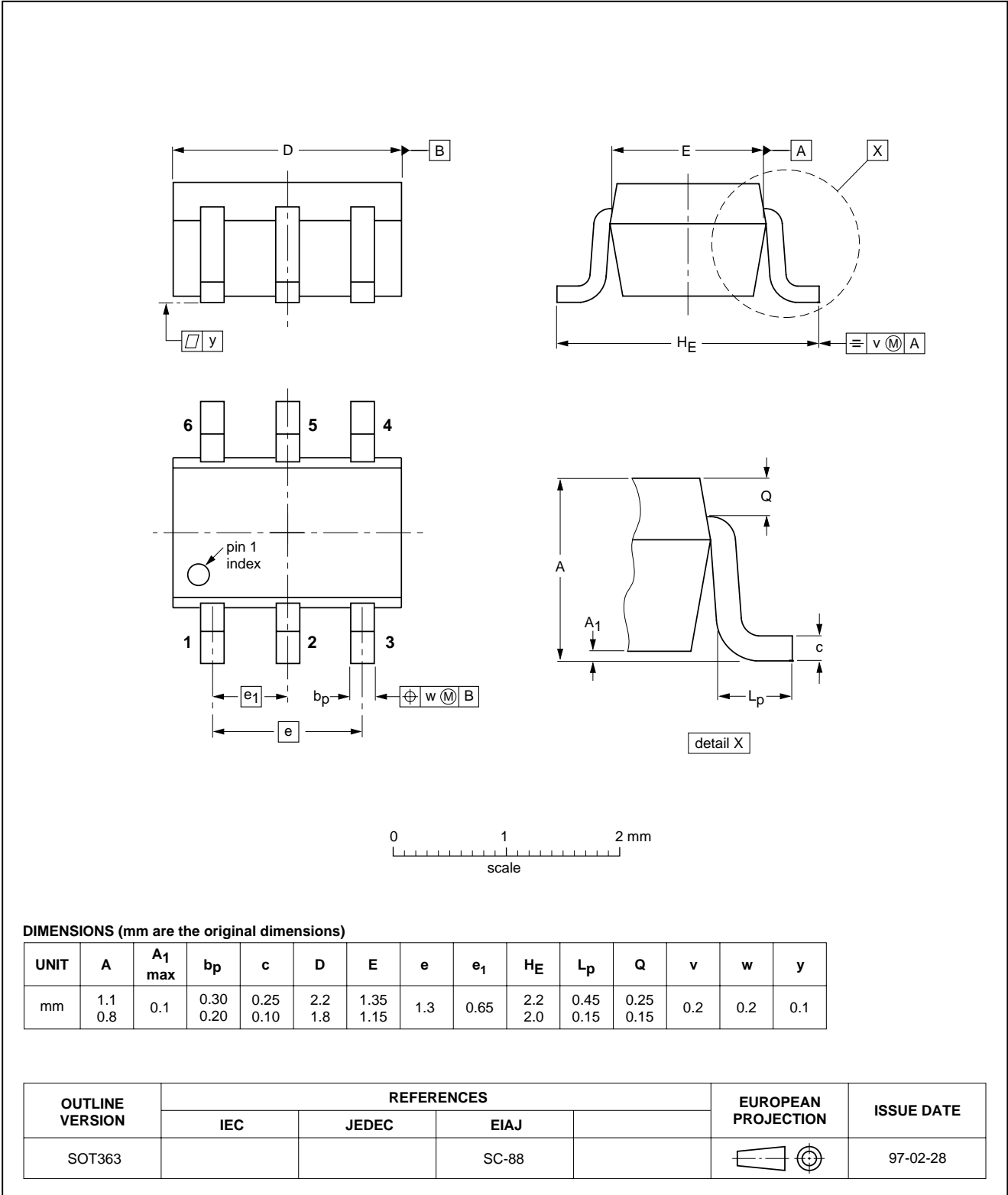


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**DATA SHEET STATUS**

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.

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1. Please consult the most recently issued document before initiating or completing a design.
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# ***NXP Semiconductors***

## **Customer notification**

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## **Contact information**

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

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