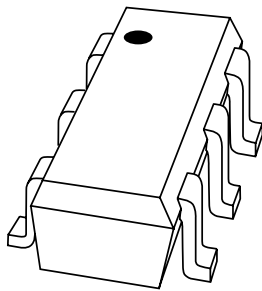


# DATA SHEET



## **PUMB11** PNP resistor-equipped double transistor

Product specification

2000 Aug 08

# PNP resistor-equipped double transistor

# PUMB11

### FEATURES

- Transistors with built-in bias resistors R1 and R2 (typ. 10 kΩ each)
- No mutual interference between the transistors
- Simplification of circuit design
- Reduces number of components and board space.

### APPLICATIONS

- Especially suitable for space reduction in interface and driver circuits
- Inverter circuit configurations without use of external resistors.

### DESCRIPTION

PNP resistor-equipped double transistor in an SC-88 (SOT363) plastic package.

### MARKING

TYPE NUMBER	MARKING CODE
PUMB11	Bt1

### PINNING

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

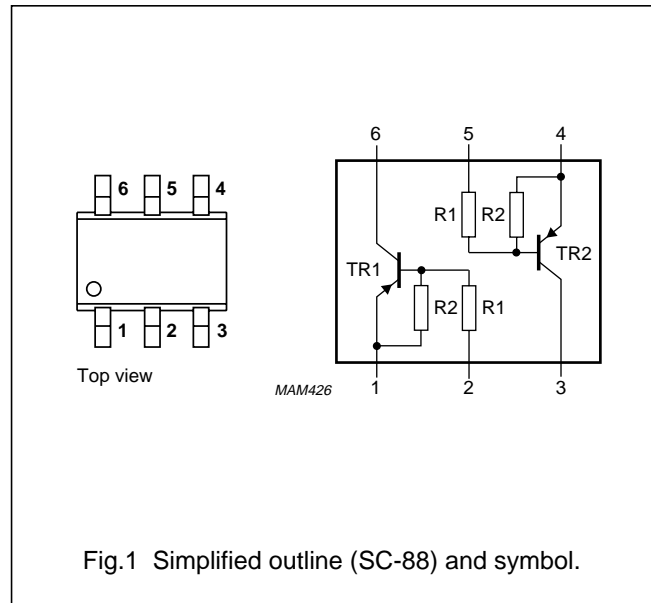


Fig.1 Simplified outline (SC-88) and symbol.

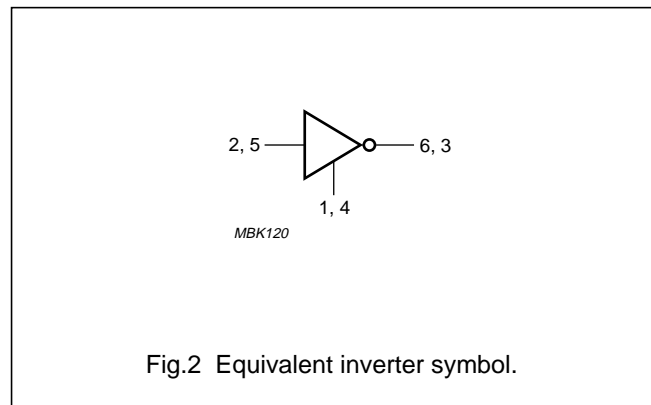


Fig.2 Equivalent inverter symbol.

## PNP resistor-equipped double transistor

## PUMB11

**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; 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. Refer to SC-88 standard mounting conditions.

## PNP resistor-equipped double transistor

## PUMB11

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	416	K/W

## Note

1. Refer to SC-88 standard mounting conditions.

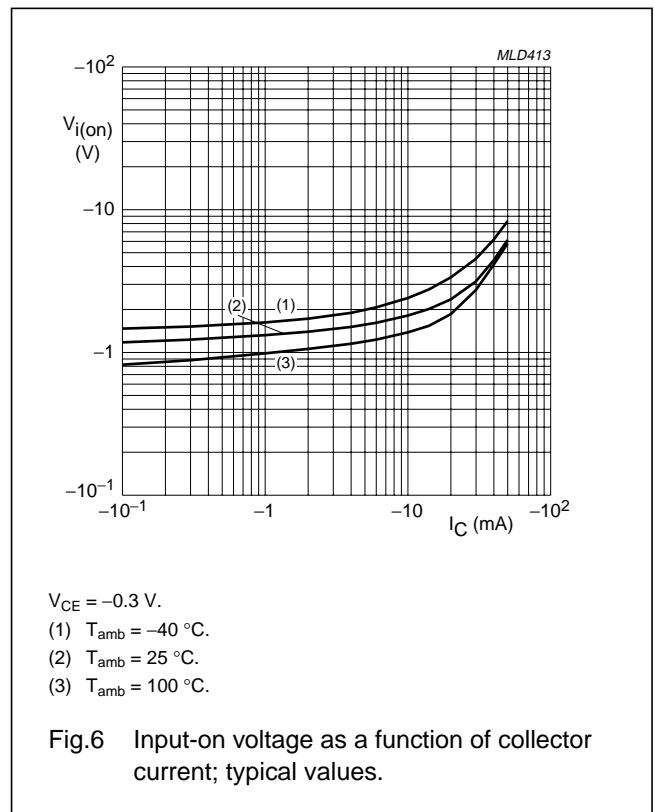
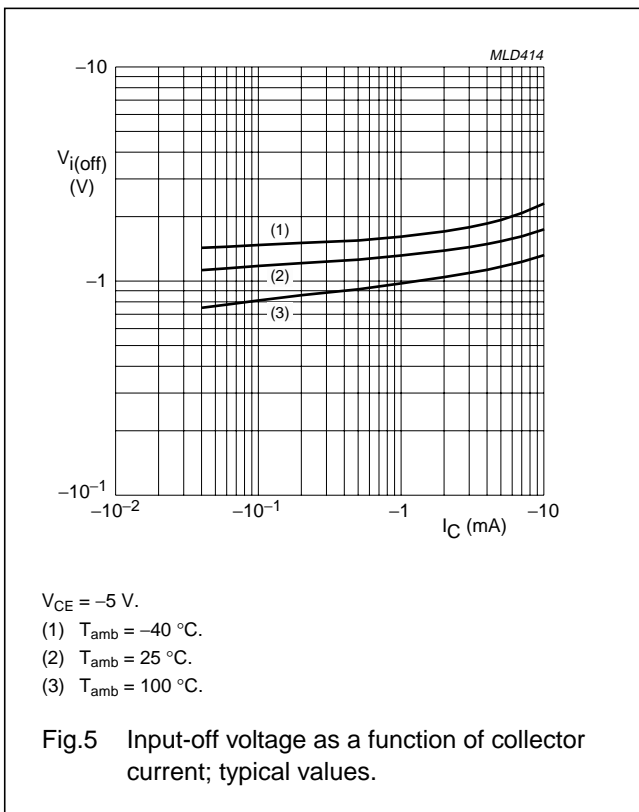
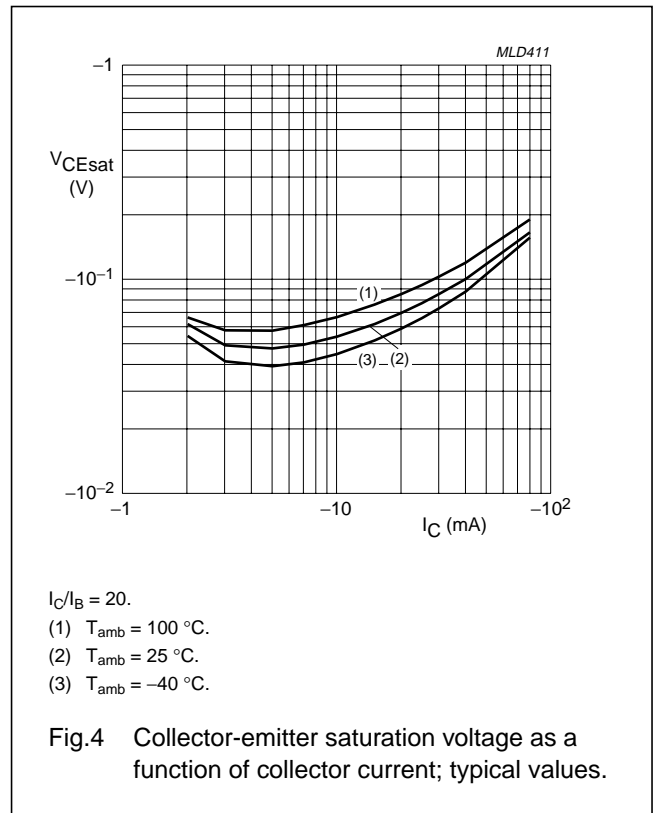
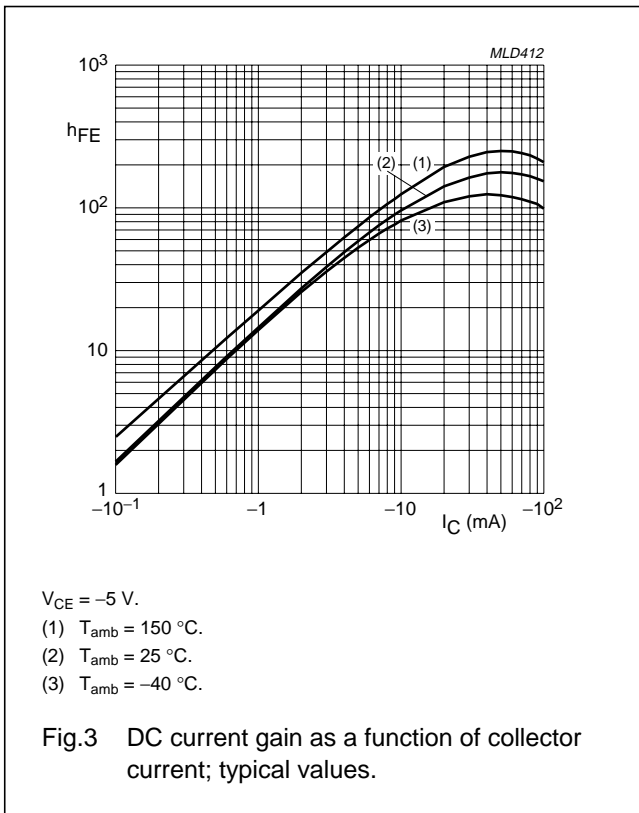
## CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Per transistor</b>						
$I_{CBO}$	collector cut-off current	$I_E = 0; V_{CB} = -50\text{ V}$	–	–	–100	nA
$I_{CEO}$	collector cut-off current	$I_B = 0; V_{CE} = -30\text{ V}$	–	–	–1	$\mu\text{A}$
		$I_B = 0; V_{CE} = -30\text{ V}; T_j = 150\text{ °C}$	–	–	–50	$\mu\text{A}$
$I_{EBO}$	emitter cut-off current	$I_C = 0; V_{EB} = -5\text{ V}$	–	–	–400	$\mu\text{A}$
$h_{FE}$	DC current gain	$I_C = -5\text{ mA}; V_{CE} = -5\text{ V}$	30	–	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -0.5\text{ mA}$	–	–	–150	mV
$V_{i(off)}$	input-off voltage	$I_C = -100\text{ }\mu\text{A}; V_{CE} = -5\text{ V}$	–	–1.1	–0.8	V
$V_{i(on)}$	input-on voltage	$I_C = -10\text{ mA}; V_{CE} = -0.3\text{ V}$	–3	–1.6	–	V
R1	input resistor		7	10	13	k $\Omega$
$\frac{R2}{R1}$	resistor ratio		0.8	1	1.2	
$C_c$	collector capacitance	$I_E = i_e = 0; V_{CB} = -10\text{ V}; f = 1\text{ MHz}$	–	–	3	pF

PNP resistor-equipped double transistor

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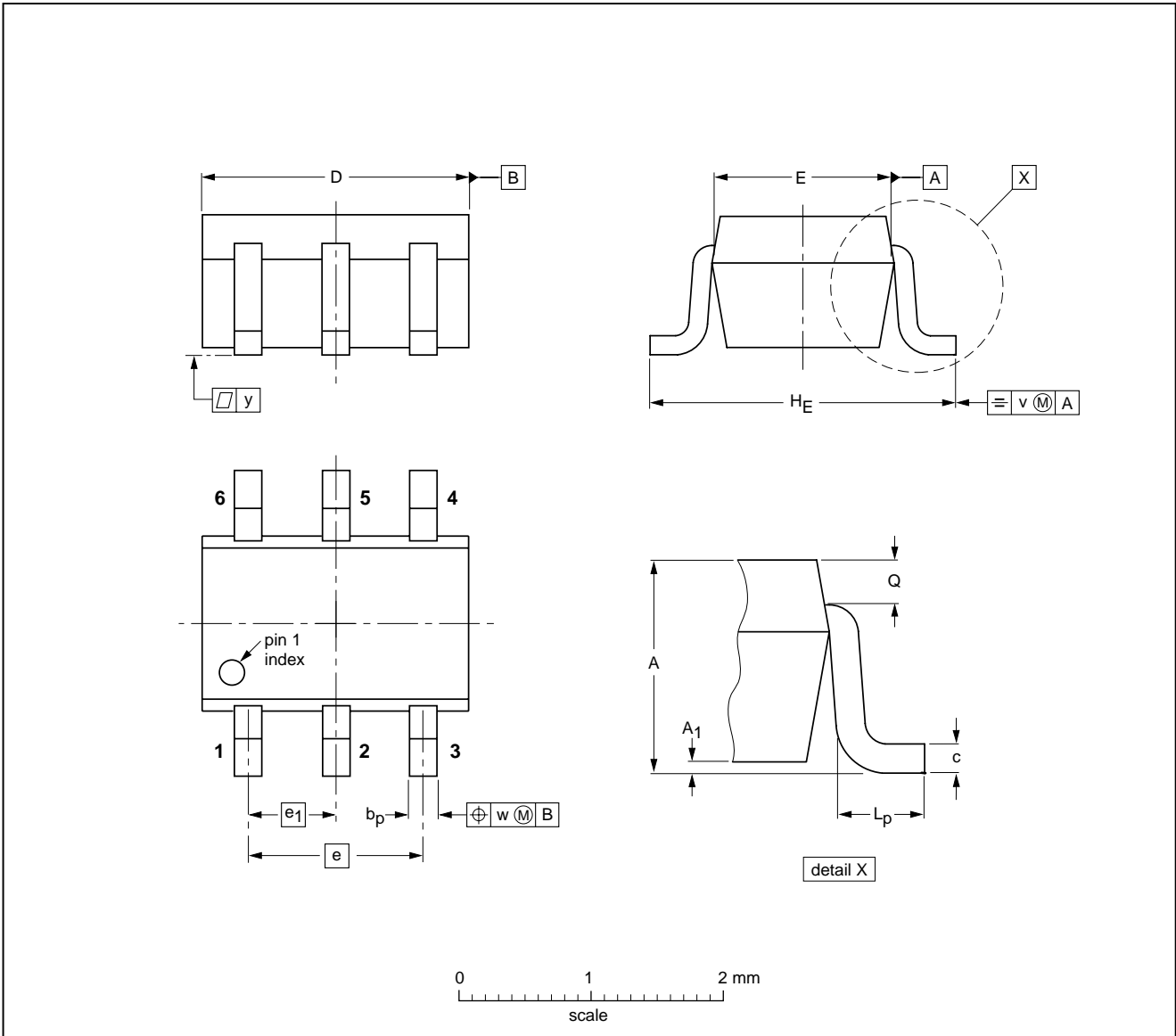
PNP resistor-equipped double transistor

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PACKAGE OUTLINE

Plastic surface mounted package; 6 leads

SOT363



DIMENSIONS (mm are the original dimensions)

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

## PNP resistor-equipped double transistor

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## DATA SHEET STATUS

DATA SHEET STATUS	PRODUCT STATUS	DEFINITIONS <sup>(1)</sup>
Objective specification	Development	This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.
Preliminary specification	Qualification	This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
Product specification	Production	This data sheet contains final specifications. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.

## Note

1. Please consult the most recently issued data sheet before initiating or completing a design.

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**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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