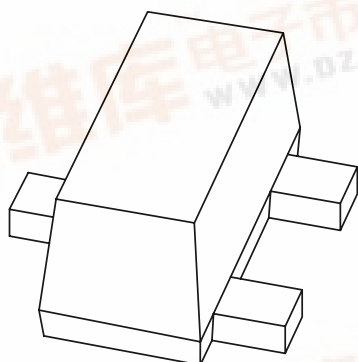


## DISCRETE SEMICONDUCTORS

# DATA SHEET



## PDTC124TEF

NPN resistor-equipped transistor;  
R1 = 22 k $\Omega$ , R2 = open

Product specification

2003 Jan 20

**NPN resistor-equipped transistor;**  
**R1 = 22 kΩ, R2 = open**

**PDTC124TEF**

FEATURES

- Built-in bias resistors
- 250 mW total power dissipation
- Very small 1.6 mm × 0.85 mm thin package
- Excellent coplanarity
- Flat leads
- Improved thermal behaviour
- Reduces number of components and required PCB area.

APPLICATIONS

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

DESCRIPTION

NPN resistor equipped transistor in a SOT490 (SC-89) plastic package.

MARKING

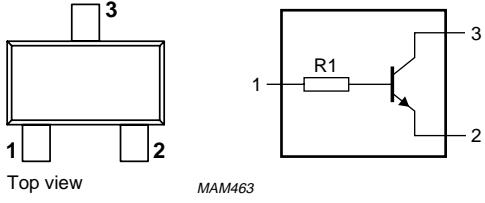
TYPE NUMBER	MARKING CODE
PDTC124TEF	35

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V <sub>CEO</sub>	collector-emitter voltage	50	V
I <sub>O</sub>	output current (DC)	100	mA
R1	bias resistor	22	kΩ
R2	open	—	—

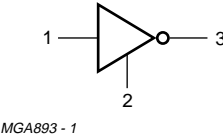
PINNING

PIN	DESCRIPTION
1	base/input
2	emitter/ground (+)
3	collector/output



The figure shows two representations of the PDTC124TEF transistor. On the left is a 'Top view' of the physical package, a small rectangular component with three pins labeled 1, 2, and 3. On the right is a schematic symbol for an NPN transistor with a built-in base resistor R1. The symbol shows the base (pin 1) connected to a resistor R1, which is then connected to the base of the transistor. The emitter (pin 2) is at the bottom, and the collector (pin 3) is at the top. The reference code MAM463 is noted below the symbol.

Fig.1 Simplified outline (SOT490) and symbol.



The figure shows an equivalent inverter symbol. It consists of a triangle with its vertex pointing right, representing an inverter. Pin 1 is at the left input, pin 2 is at the bottom, and pin 3 is at the right output. The reference code MGA893 - 1 is noted below the symbol.

Fig.2 Equivalent inverter symbol.

# NPN resistor-equipped transistor; R1 = 22 k $\Omega$ , R2 = open

# PDTC124TEF

## LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	50	V
$V_{CEO}$	collector-emitter voltage	open base	–	50	V
$V_{EBO}$	emitter-base voltage	open collector	–	10	V
$I_O$	output current (DC)		–	100	mA
$I_{CM}$	peak collector current		–	100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$ ; note 1	–	250	mW
$T_{stg}$	storage temperature		–65	+150	$^{\circ}\text{C}$
$T_j$	junction temperature		–	150	$^{\circ}\text{C}$
$T_{amb}$	operating ambient temperature		–65	+150	$^{\circ}\text{C}$

## Note

- For mounting conditions, see “Thermal considerations and footprint design for SOT490 in the SC18 Data Handbook”.

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	in free air; note 1	500	K/W

## Note

- For mounting conditions, see “Thermal considerations and footprint design for SOT490 in the SC18 Data Handbook”.

## CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$V_{CB} = 50\text{ V}$ ; $I_E = 0$	–	–	100	nA
$I_{CEO}$	collector-emitter cut-off current	$V_{CE} = 30\text{ V}$ ; $I_B = 0$	–	–	1	$\mu\text{A}$
		$V_{CE} = 30\text{ V}$ ; $I_B = 0$ ; $T_j = 150\text{ }^{\circ}\text{C}$	–	–	50	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = 5\text{ V}$ ; $I_C = 0$	–	–	100	nA
$h_{FE}$	DC current gain	$V_{CE} = 5\text{ V}$ ; $I_C = 1\text{ mA}$	100	–	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 10\text{ mA}$ ; $I_B = 0.5\text{ mA}$	–	–	150	mV
R1	input resistor		15.4	22	28.6	k $\Omega$
$C_c$	collector capacitance	$I_E = i_e = 0$ ; $V_{CB} = 10\text{ V}$ ; $f = 1\text{ MHz}$	–	–	2.5	pF

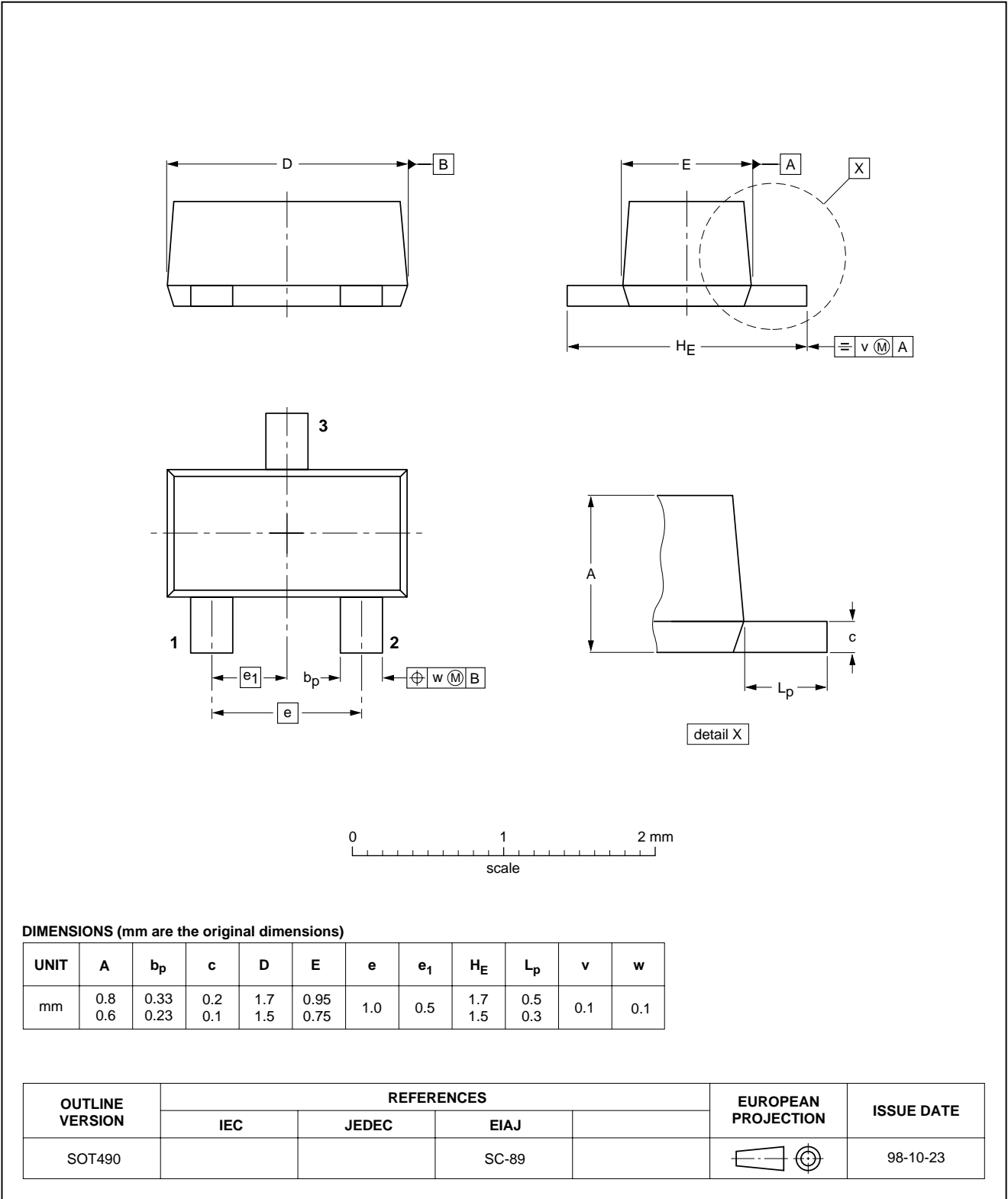
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PDTC124TEF

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT490



NPN resistor-equipped transistor;  
R1 = 22 k $\Omega$ , R2 = open

PDTC124TEF

#### DATA SHEET STATUS

LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	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.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
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3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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PDTC124TEF

**NOTES**

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PDTC124TEF

**NOTES**

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